PROGRESS OF RESEARCH ON GENUS SOLANUM SPECIES DURING THE LAST TWENTY YEARS

An annotated bibliography

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A LEARNED MAN WITHOUT WORK IS
A CLOUD WITHOUT RAIN

DEDICATED TO MY PARENTS

A C K N O W L E D G E M E N T

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(SHAGOOFA BANO)

C O N T E N T S

INTRODUCTION

INTRODUCTION

Economicaly the genus Solanum is very important as several species are source of food, fodder and drugs (nandkarni[6], 1927; Chopra, Nayar[3] and Chopra, 1956; Chadha[1], 1972). Several species of solanum produce glykoalkaloids which are used in oriental medicine. Some Varieties are grown as ornamentals.

Owing to its great economic importance the genus Solanum has attracted the attention of cytogeneticists, plant breeder (Magoon[5], Rama anjam and Cooper, 1962) and Biochemists.

The most important species belonging to this Genus are S. tuberosum (common potato), S.melongene (Brinjal)and S.nigrum complex.

The common potato is not only a prime food but also a source of starch flour dextrine syrups & several alchohols. The characteristic feature of the plant is the presence of under ground stems bearing the eadible tubers. The plant producing the tubers belong to

species S.tuberosum but andean potatoes are produce by another species, S. andigenum.

The fruits of egg plant (S.melogena) are consumed as vegetable all over India. It is cultivated widely through out all over world. It is one of the most important vegetable crop of our country the plant is generaly grown twice or thrice during the year there fore fruit is available almost the year. The fruit have high nutritive value. The medicinal importance of egg plant is also not worthy (NandKarni[6], 1927) & Chopra[3] Nayar 1956; Kritikar and Basu 1957, Chandra Murti 1968. In many countries of orient leaves fruits & seeds are used for curing diseases like syphlis. Its unripe fruits are cardiotonic improved apetite & enriched the blood. Ripe fruits are laxative. A paste of leaves is applied on syphlit wounds and decoctions of roots are also used to alleviate pain. Ayurveda treats it as appetisers aphrodisiac, cardiotonic and beneficial in "Vata" and "Kapha" etc. (Seechandra[2] & Murti, 1968).

S.nigrum complex also is very important from medicinal and other point of view. In this complex there are many species and naturaly occuring diploid tetraploid & hexaploid form. The species members of

S. nigrumshow great resemblence among themselve & differ from genus therefore correct identify of members of complex has been puzzled to the taxonomist. In order tosolve this puzzle biosystematic studies of complex are been done through out the world in order to determine their origin & evolution. S. nigrum is economically very important as leaves of black night shade leave long being used in medicine for treatment of various diseases & ailment (chadeh 1972) solanine a bitter gluco alkaloid was first isolated from S. nigrum several other alkaloids are also obtained from the different species of S. nigrum complex. The pounded roots of this plant are applied gums to relief toothache. The fruits are chard & pounded & applied in skin complains. The decoction of fruits is used a used as enema.

S. avicular is a rich source of alkaloid solasodine which is obtained from its leaves stems, flower & green fruits. The plants is used also in poultisis for sores & Ulcers. Its sap is also applied to cureitch cabies and wounds. S. gigantium was used as a dressing for fowl ulcers and its berry has been used as a remedy for throat

absis.

S. incanum is used as a remedy for toothache & for sore throat the Juce of the plant is used a remedy for ring worm the juce of fruits is also used by the European as remedy for dandruf the root is remedy for abdomenal pains & lever troubles watt and breyer - Brand wijk 196.

S. indicum half ripe fruits of this plant are employed in preparation of curies & chutten leaves are used as vegetable and also surve as fodder for goats. It is also used as a remedy for wring worms & uminary Troubles in Africa. In India it is used as cardiotomic, Aphrodisic and astringent a resolvent and a remeding for Asthma cough & chronic fever (NandKarni 1927) Its root is also used as an internal rainedy for difficult child birth for too thache, for fevers, for skin dieses in children with ginger Juice it stops vomating.

S. sisymbrifolium The fruit Juce & leaf paste is used on sheeps and horses as cure for scur and itch. The furit is also used as remedy for wring worm in horses. S. hispidum the fruit of this plant is good source of steroideal sapogenins and hecogenins.

S. khasianum It is a rich source of steroidal alkalid solasodine which is obtained from its mature fruits.

S. surathense the fruits of the plants are used in curies the seeds are also eaten & leaves are used as fodder for goats. Its roots are expectorant and are employed incough esthema & pain in chest stems flower & fruits are used in borning sensation of feets accompianed by eruption the juce of berry is used in sore throat. The plant is diuretic is used to cure dropsy. S. xanthocarpm the roots of this plant have been recognised as an effective diuretic expectorant and is used in cough esthma and pain inchest. The juce of berry is useful in sour throat. The leaves are applied locaiy to throat pain the juce is given to black pepper in rheumatisum.

S. dulcamara. berries are diuretic and useful in skin diseases they are also used in syphilitic infection chroni rheumatism and enlargement of lever leaves stems and fruits contains alkaloid solanine.

S. Torrum the fruits are eaten as vegetable & are s aid to be good for the entargement of speline

fruits contains alkaloids, steroline and solasonine.

S. Seafophiathinum berries caused illness among children & are said to be poisonous to fowl & rabbits & toxic to sheaps the leaves contains chlorogenic acid extracts of plant are antiprotozoal.

In view of the importance of the different plant belonging to this genus of preparation of Bibliography of scientific papers of genus have been ader taken.

This dessertation is divided into two parts. Part one is descriptive and this part is divided in to six chapters. Chapter 1.1 surveys the origin and taxonomy of solanums. Chapter 1.2 discusses anatomy, Morphology and Morphogenesis of solanums in detail chapter 1.3 deals with physiology of solanums. Chapter 1.4 discusses the cytogenetics, Hybridization and Mutation breeding of solanums. Chapter 1.5 studies the Diseases and disease resistant of solanums chapter 1.6 deals with the chemical constituent and food value of solanums.

The refferences from the bibliography give the numbers of the entry in the parenthesis, the one taken from out side are underlined and given in full at the end of the chapter.

This part ends with a list of periodicals with abbriviations, and a list of abbriviations used in the bibliography.

Part two contains the main bibliography and alphabetical indices that is outhor and title index.

Scope:- This bibliography contains 283 enteries and covers the period of 20th centruy.

Sourcesof compilation:- The bibliography is mainly based on original sources and no secondary sources and no secondary sources have been included. The periodical beering the concerned topic has been thoroughly search outfor treacing the articles. Annotations were pepared after reading the article thouroughly.

Standard followed:- As far as possible the ISI (2381-19) have been followed. The papers read in symposia have been treated as composite books and entered in the bibliography inaccordance with the recomendations for such works given in the ISI.

For the abbreviation of titles of the periodicals, the practice of Biological Abstract has been followed.

Abstracts:- The enteries in the bibliography contains information tupe of abstracts, giving full details about the articles.

Arrangements:- The arrangement of enteries is under the co-extensive subject heading. For this purpose list of subject heading was compiled and it was arranged alphabetically. The enteries are serially numbered. An entry contains.

(a) serial number
(b) Name of author
(c) Title of author
(d) Name of periodicals.
(e) Volume number
(f) Issue Number
(g) Year.
(h) Inclusi ve peges

The botanical names of plant used are underlined.

Specimen Entry

241. ALBUT (Keith). Hair types as taxonomic character in solanums. In HAWKES (JG) ed symposium on biology and taxonomy of solanaceae. (Birmingham) (1979) 7, 307-19.

265. GUMINSKI (St) etc. Effects of some deter gents of the increase in biomass and accumulation of mineral compstion. Acta Soc. Bot. Pol. 41,2; 1972; 253-64.

Indices:- They contain author and title indices arranged alphabetically.

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PART ONE

Chapter I·I

THE TAXONOMY AND ORIGIN OF SOLANUM

The genus solanum contains about 1700 Spc. (Willis 1960) ou t of these 100 are tuberiferous while the rest are nontuberiferous. The genus is dominant in south & control America but shows a very wide distribution ranging from tropical to temparate region of world & from sea level upto 2400 meters hight. Out of 37 Spc. reported from Asia 28 have been reported from India. Clarke (1885) describe 27 Spc. in Hookers flora of British India (Hooker 1885) Santapau (1948) added one more Spc. to this list by describing a new species from Bombay, S. macannii. Following Hiesler (1917), Bitter (1922) has divided the genus solanum into two separate genera solanum & Lycianthesl, the letter including about 100 Spc. Santapau (1948) has transfered 6 species to genus Lycianthes. clarke has also put these Spc. in a separate subsection. The remaining 22 Spc. are classified into two distinct sections, one consisting of unarmed species and other consis consisting of species armed with spines. These two group are morphologically distinct the members of one group do not cross wit-h the members of other gro ups. There fore swamy nathan (1949). Mittal (1950)

& Bhe-duri (1951) have clividedthese spe. into two reproductively isolated and morphologicelly celly distinct groups group one with 15 Spe. includes the spiny Spe. and S.melongena, though many varities of latter do not posses spines, while group two with seven species include the spineless spe. like S.nigrum complex and S.tuberosum.

On the basis of crossability relationship Bhaduri(1951) indicated that S.melongena vareity inoenum, S. Melongena Var. potangi.S. macoonii, S.innoenum, S. Xanthocarpum, S. integrifolium and S. Coagulans are related Spe. S.Xanthocarpum produces partialy fertile hybrids with S.melongena. The wild varities of S.melogena like inoenum & potangi producefully fertile hybrids when crossed with the cultivated varieties S.melongena. S. Xanthocarpum prod uce sterile hybrids with S.Indicum, Bhaduri(1951) failed to get hybrids between S.melongena & S. indicum and suggested that two species are incompatible. Duthie (1911) suggested that Solanum coagulance and S. inoenum. are one & the same Spe. and the names are synonynous Santapau. (1948) suggested that S.macanii & S. Xathocarpum are almost similier to each other Krishnappa and Shennavirieh (1965) suggested, on the

basis of enissibility studies, that S.Khasianum & S.Xanthocarpum. S.indicum , S.melongena and S. ectiletissenum are related spc. Omidije (1975) suggested that their is closre relationship between S.macrocarpum & S. melongena than that between S. macropapum & S. incanum and they indicated close relationship between 2 varieties. D'Arcy (1976) has studied Biology & Taxonomy of solanaceae recently. Keerti and rao (1978) studied the affinities of spinus solanums.

Solanum is a large genus of herbs, shurbs & rarely trees. The genus is economically very important as several species are sources of food fodder & drugs. Some varities are grown in garden as ornaments the common potato (S.tieberosum) is not only a primefood but also a source of starch flourdextrin, syrups, several alekalo fodder specialy for hogs & a host of other minor industrial products. Fruits of egg plants are consumed as a summer vegetrable all over India. Leaves of black night shade (S.Nigrum) have long being used in medicine for treatment of scrofulous dyscrasias Baily (1947)Gopala Swamy Ienger (258) (Wealth of India).

Several spc. of Solanum produce glycoalkaloids like solanine, Solasonine, Soladulsi-ve solamargine, solamarine, Solanidine and solasodine. Hydrolysis & removal of sugars these yeild streiodal alkaloids. Solanine has been resolued into 6 glycoalkaloids. With common a glycone. Solasonine a wo widely distributed among members of genus which produce solasodine, solanidine the S.glycoalkolodes are toxic to animal when injected. like sapponine they posses antifungal. Properties solanum alkaliods have close relationship with stiroidal sapogenins.

The origin of the genus is undecided members of this genus have been refferod in the sankkrit literature as early as 1100 A.D. soil. Melongena (Brinjal) was refer d as Amarkosh. Decondally (1959) regarded it as a native of Asia as many wild forms like S.incanum S.indicum. S. Xanthocarpum and S.integrifolivr are endemic in the parts of India & Burma Greeks and Romans did not know these Spc. S. tuberosum (potato) was known to early Amoreans but S.melongena was not mentioned in Europeam literature before the boginig of 17th century. S.nigrum was known to early Greeks and Arabs. But Clarke (see Hooker 1885) and Filov 1940 suggested the Indian origin of S.melongena. Vavilov (1951) suggested that because of existance of

large no of vaRiaties. The egg plant is native of In Indo Burma region. Messedaglia 1951 refers to the fact that species of solanums were cultivated as ea erly as 15century in Italy & By 18th cent. in Arabia (Chandra and Murtey Bajdoso and Vidoki (1975) have studied evolution of variation of S.melongena Khan (1976) indicated Indo Burma originof S.melongena. He also indicated its evolution on the basis of its wide distributionof the cultivated variety through out the world. Khan (1978) has described in detaily the Biology & taxonomy andorigin of solanaceae.

The genus is economically very important as several spe. are sources of food fodder and drugs some varieties are grown in garden as ornamentals. several spe. of soil produce glycoalkaloids which yield steroidal alkaloids.

Cytotaxonomists in general and those dealing with the genus solanum in particular have studied the S.nigrum complex, from several point of view As it will be explained latter, the correct identity of the members of the traditional taxonomists. Although some aspects of interrelationship of the spe. of this complex have been studied by Bhaduri (1945, 51) waster Ward (1948) , Tondon and Roy (1964,66)

a good deal still remain to be done to present a clear pifture of the evolution origion on relationship of the species concerned.

The traditional system of classification are mostly based on external morphology many plants described as a species are found to be nearly the variants of other Spe. and not full fledged species. Linnaeus between this species were dividely granted Desarate mentioned that the view that many Spe. and genera Had arisen by hybridization.

In late twenties work on experimental taxonomy begun with the investigation of Marden Jones, Turrill and Gregor, The significence of S.nigrum in relation to taxonomy began to be realized. The winge and Denmark has formulated a hypothesis of the origin of some Spe. through chromosome doubling. The significences of paly ploidy in the orinin and solution of the Spe. is well recognized sleb (1958 and 1966).

All Biologists are now aware of the contribution of biosystematics to taxonomy A biological concept of the sps is developing many bio-systematists claim

that species are natural population which are genetically distinct and reproductively isolated from letter species while being potentially interfertile among them selves. (MAYR, 1942) (STEBBING , 1950. DOBZHANSKY, 1951, LOVE 1960.) The polyploids are as a rule are derived from relatives with lower chromosomenos. Once the suspected ancesteral spe. have been identified, the hypothetically evolutionary course of hybridisiazation & chromosome doubling can be repeated in the garden & the hypothesis can be subjected to experimental verification.

The common potato destined to become a staple diet second to none in much of the white men's world was first domesticated in antiquity by the Indians on the high slopes of the Andes. It has become a source of starch dextrin, syrup, and several alkaloils Although unknown in North America until introduced there by European colonists the Irish potato was the mainfood in the diet of the and various dried product are made from potato. An unknown benefactor first introduced the Irish potato into spain about close of the 16th century, long before it had ever seen Ireland From there it spread to Italy, Austria, Germany and British Isles. In Northern Europe it was destined to keep Germany alive during two Worked World wes and it became so important in Ireland that its failure

from blight in 1845-47 caused the wholesale migration of over croinded Irish peoples to a new land across the ocean, thus affecting the destiny of the U.S. Frederick the Great of Prussion ordered potatoes to be widely planted in the dark of the moon to be harvested at end at the instigation of one Auguste parmentier, who was attempting, amid wide spread coffing to introduce potato growing in France, Marie Antoinette appeared at a royal ball wearing a wreath of potato blossom in her hair. Mean while new world settlers were bringing the potato to north American within the last century potato growing has needed no encouragement. Yields and quantity have been steadily improved to make the potato one of the world's greatest crops.

Nigrum and its related spp. are known as black night shades or deadly night shades constitute a taxonomically difficult spp. complex of very variable forms with world wide distribution. Some authors like Dunal 1852 and Bitter 1911 have recognized several species in the group while others like Bentham (1869) and Hitchcock 1959 have maintained that there is but only one highly variable spp. namely,

S.nigrum. The actual situation seems to be some what between these two extremes.

The wide tolerance of members of S.nigrum complex to different type of habitat and their ability to flower while still young and prolific production of seed contribute to the persistent weedy nature of the species of this group. Stebbins and peddock 1957 considered the European hexaploids S.nigrum to be native of temperate region Henderson (1974) indicated some doubt regarding the centre of origin of S.nigrum. By its relatively rare occurrence in the American countinents he suggested Russian origin. He also suggested that S.nigrum may have come from Middle East or even India. Jorgenson (1928), Bhaduri (1933) and swaminathan 1949 considered S.nigrum as an allopolyploid on the basis of regular meiosis in two subspecies of S.nigrum ssp. nigrum and S.nigrum ssp. Schultessi in Australia Henderson (1974) concluded that the plants of S.nigrum tends to support the suppsition of evolution of the spe. thro rough allopolyploidy by the method suggested by Tandon and Rao 1964 rather than that suggested by stebbins (1950).

Wettstein 1895 divided the genus solanum into five subgenera as indicated below;

(1) Pachystemonum This contains about 400 species including S.tuberosum and S.nigrum complex.

(2) Lycianthes This contains about 80 species.

(3) Leptostemonum. This a large group containing 400 spc. including S. melongena

(4) Lycopersicon. A group with 20 species including Lycopersicon esculentum.

(5) Nycterium a small group with 14 species Hegi (1907) divided the genus solanum into two subgenera namely.

Eusolanum and Leptostemonum . The former is further sub divided into five sections as follows.

1. Morella

2. pseudo capsicum

3. Dul Camara

4. Lycopersicon and

5. Tuberarium.

m The section Tuberarium includes species of Solanum such as solanum melongena Hassler (1917) raised the subgenus lycianthes to a separate genus Lycianthes (Dun) Hassl. Mainly on the basis of fruits.

Bitter (1920) accepted the elevation of Lycianthes to generic rank but extended its limits by placing more emphasis on the 10 partite calyix and inwardly facing ellipsoidal anthers with oblique pores than on characters of fruits. This has resulted in the transference of a large number of forms from the genus solanum to Lycianthes.

Dunal divided the genus solanum into two groups as follows.

(1) Pachystemonum ; This group include spe. which are devoid of spines o n the vegetative parts. The anthers are short & thick.

(2) Leptostemonum ; This group includes species armed wit h spines. The anthers are long and narrow.

T he section Pachystemonum is further subdivided into five subsection.

(1) Tuberari

(2) Morela

(3) Dulcamara

(4) Micranthus

(5) Lycianthes

Another broad division of the genus solanum has been based on the tuberiferous and non tuberifera nature of the species.

Chapter I.2

ANATOMY MORPHOLOGY & MORPHOGENESIS OF SOLANUM

Morphological studies have been given scanty attention by workers. The morphological variations in S. Melongena leading to identification of varaities has been done by different workers Morphological characters of S. melongena have been compared with the character of allied spe. like incanum, S. hispidum S. integrifolium, S. indicum, S. Khasianum Chadah 1972 has given the morphology of different spe. of solanum found in India in his book the wealth of India rawmaterials vol. 9 Allanchriled (208) (1979) has studies the range of branching pattern in reporductive phase of members of solanaceae; Symon (255, 226) (1979) has studied sex form in solanum. Inamdar & Murthy (57) 1978 has studied the venation in the leaves of diffe rent members of solanaceae. Milos levov (181) 1971 studied the ultra structure organisation of stomatal gaurd cell in solanum Nishino (92) 1978 studied the corolla tube formation in S. nigrum, Chile (249,250) 1979 studied the pollen grains of 19 taxa of nigenan solanums. Islan (79) 1971 studied

the anthers of different varaities of S. melongena; Hilas Nikova (12) studied the mechanism of embryogenesis in culture of pollen sac of different plan ts some of them belonging to solanaceae. Shal (60,6) and Patel 1970 studied morphohistogenesis of Vegetative and floral buds of brinjal. Rembo and white 1972 studiod Ultra structure of cork cells from potato tubes T he development of ovule & embryo sac in S. Khasiam was studied by Mohan (213) 1971 mechanism Dehi scence of anthers was studied in solanaceed by Nama Kaiva (82) 1919. The seed coat of seeds of solanaceous pl plant was studied by Dassolingh 1921. The leaf of potato was culture for morphogenetic studies by Coutt (148) 1979. Hammaid (240) 1979. studied the effect of growth regulators on morphogenesis an solanums, Kumar and Varing (128) 1972 studied factors controling s-tolon developmen t in potato Kaley and Nagaiah (140) 1972 studied hairy sprouts of potato Shal and Patel (60,6) 1972 studied t-he differentiation of cell zone in S. melongeua

Chapter 1·3

(6) Physiology of Solanums:- (a) Floral Biology

Many plant breeders have studied the floral biology of many Spc. of Solanums. Specialy of S. Melongena. Kariaeki 1934 (38,54) Jones & Rasa 1938 Smith 1931, Magtang 1936 Tatebe 1938, Paul & Singh[5] 1936 Kirishn[2] Murthey, Subraminian 1954. Parkash, Parsad 1958 Ogaesjan 1965 - 66,69 Paul Gay. Os[4] Wald 1967 Pal, Gel Teller (68) 1969 Palgy olah 1969 (56), Khan Rab, Siddiqui 1971 have studied the floral biology of S. melongena. Morphology of the flower, the blooming of flower, dihisence of anthers and Longavity of pollen, receptivity of stigma pollination self & cross, Heterostyly have been studied in detail in different varieties of egg plant. Recently Magliotti 1979 (45) studied floral biology of S. melongena. He have described floral morphology flowring physiology pollination biology and physiology & control of fruit setting in plant.

Inddction and Parthenocarpy studied by Baily and[1] Munson, 1891. Yauda 1933 studied induction of theparthenocarpy in S. melongena through pollinating stigmaswith petunia pollen. Pal and olah 1969 (56) induced parthenocanpy by mechenical stimulation

Krishna murty and subramanian induced parthenocarpy by foliar spray of 2-4-D. 11Fruit maturity and seed dormancy have studied by palsingh 1943 and vivipary was reported by pal and singh 1943. Bhore, bhabkar, Jaman 1966. phadnis[5] 1967. Nain 1977 has devised a short storage technique for the pollen of S. Tuberosum.

(b) CULTURE STUDIES:-

A few workers have studied the Tissue culture of the different members of genus solanum supniewska and Barbra 1972 supniewska 1972 cultured the tissue of S. Laciniatum. and analysed some compounds biosynthesized in Vitro. Aleksenko (24) 1977 was able to obtained callus formatin in anther cultures of S. Laciniatum. Harn (89) 1971 cultured anthers of S. nigrum & studied the changes in the calls formed. Ochimiya (83) 1971 cultured unfertilized ovury & ovule of S.melongena and was able to induce development of haploid plant Roger (229) 1979 was able to do clonal propagation of S.Curtilobum by cultures of shoot meristems. Raj and Herr (96) 1970 isolated protoplast from the placental cell of S. nigrum berries & studies its nutritional requirement in culture.

(c) GROWTH STUDIES:-

Growth studies have been made on different members of genus Solanum. Roziervinto (164) 1970 studied the growth of leaves and photosynthesis by cultivating tubers of potato. Stalk Necht (143) studied the induction of tubers on the excised shoot by the addition of coumarin in cultures. Guminski (265) 1972 studied the growth and accumulation of minerals in S. Lycopersicum as a result of the application of detergent. Langil (123) 1972 studied the effect of phosphonic acid on rhizome & tuber formation of potato sharma & sen (95) 1971 studied the retardation of senescence and increase of sugar & dry matter by application of penecilin. Wooley (2) 1972 studied the role of root cytokinin & apical dominance in the control of Lateral shoot development in S. Andgena. Hourment and Michel (189) 1972 studied the change of permeability due to ageing & influence of calcium in S. Tuberosums, yamamoto and osen (163) 1976 studied the alteration in peroxidase activity of potato tuber tissue treated with DNA fraction of different varieties Haden 1972 studied electrical impedance of stem tissue of solanum clones.

(d) THE LIGHT EFFECT & PHOTOPERIODISM: -

Hene Buth (121) 1972 studies the effect of light o n development of potato tissue Hennies 1971 studies the tuber insitiation in potato in relation to photo period & growth substances.

(e) METABOLIC STUDIES: -

Many workers have studies the metabolism of carbohydrates, fats alkaloids and other substances in different spc. of solanums. The fat metabolism and acetylcoenzyme A synthesis was studied. in potato by Heving and stumpt (133) 1970, Wu and Salunkhe (106) 1972 studied the control of chlorophyll & solanine formation in potato tubers through oil treatments Ripperger 1971 studied the Biosynthesis of some solanum alkaloids. Hawker (177) 1972 studied the starch synthesis in potato tubers under the effect of glucosyltrans ferase. De Nethencort and Costa (268) 1968 studied the starch formation & hydrolysis in tomato microspore. Judevicz (120) 1972 studied the effect of isopropanol on the activity of particulate starch synthotase. Horitsu (118,136)

1968 studied the effect of game ray irradiation on structure of starch in potato. Parmentier1979 studied the biosynthetic path way of chlorogenic á acid in solanaceae. Sohneiger (156) 1970 studied the metabolism of certain steroids in potato tuber.

(f) ENZYME FORMATIN AND ACTIVITY: -

Many workers have studies the formation of enzymes & growth regulators and effects on the physiological activity in different members of genus solanum. Hochstrasser (160) and Merle 1969 studied the protiase inhibitors of potato tubers. Mc Glasson and and Franlin (267) 1979 studied the effect of certain geneson changes in abscisic acid and gibberellin activity during growth & senescence of tomato fruits. Dorffling (263) 1970 studied th quantitive changes i in abscisic acid content during fruit development in S.Lycopersicum. Banabdelkader (113) 1973 studied the desaturation of oleoyl conenzyme A. by microsomes isolated from potato tubers Gerbrandy and Angeli (184) 1978 isolated potato phosphorylase isoenzyme palmer & Barker (128) 1972 studied changes in enzyme activity during elongation & tuberization of stolon in potato. Foeldest (34) 1969 studies localization of active substance in plant organs of S. Lachiatum Galliard and Dennis (148) 1974 studied the isoenzyme of Lipolytic acyl hydrolase

and estrase in potato tubers Lenz (75) 1970 studied the effect of fruit on sex expression in egg plant.

Water relation studies were made in potato tissue slices by flowers 1972 to see the effect of water deficient on respiratory metabolism.

Many workers have studied the problem of mineral nutrition and accumulation of differentions in the tissues of Brinjal fruits and potato plants. Mytishi & Keshyap (88) 1968 studies the effect of foliar spray of some trace element like zn and Boron on protein content of Brinjal fruits. Shiva Shanker (58) 1971 studies the effect of foliar sprays of ammonium so_4 and urea on leaf anatomy of brinjal. Imam (82) 1967 studies the effect of CO_2 environment on the growth flowering & fruit setting of egg egg plant. Leite (117) 1972 studies the effect of the addition of Boron to NPK on the productivity of potato lee (144) 1972 studied the interelationship of Al and Mn ions in potato plants. Lannoye 1970 studies the chloride exchange & accumulation in fleshy tissue of potato tubers. Chamberland and

campagana (122) 1969 studied the effect of various doses of NPK on the production & quality in potato.

Baur and Bovey (165) 1970 studies the uptak teke of picloram by potato tubers singh & sharma (139) 1972 discoverd the alteration of growth and metabolism of potato plant due to ca deficiancy Hermann (203) 1969 studied on ammonium tolerence & its toxicity in egg plants Kurnosov (28) 1971 studied the nitrogen nutrition in night shade.

Sander (188) 1972 studied the influence of a short period of evaporative cooling on the distribution of C 14 in potato plants.

Palenzonal (269) 1967 studies heat induced radiosensitivity in tomato. Olimpinko (124) 1972 studied Radiosensitivity of some natural & experimental potato autopolyploids.

storage studies have been made by meg workers in potato tomato and brinjal Gentice 1971 studied the possibility of Og injury in stored tomato fruits.

Jarvis (188) 1974 studied the variation of free sugars & lipids content in different potato varieties during Low temp. Storage Patekh (276) 1969 studied the effect of CCC green suspention on Maintaing freshness in brinjal & tomato during storage.

Frost tolerence & Resistance studies have been made by few workers in potato. Sukumaran (154, 154) and Weiser 1972 have studied the frost tolerence of potato leaves. Manner and soomineu 1970 studied frost hardiness of many potato variety. Chen and Li (248) 1977 have studied the ultra structural differences in leaf cells of solanums in relation to their frost resistance.

The effect of treatment with certain chemicals on the yield of egg plant & potato have been done by certain workers Restino (86) 1971 studies th e yield & Response to plant hormones Li some varieties of egg plant. Brighigna and Restino (66) 1969 studied the effect of application of plant harmones on egg plant flowering. Restino 1971 studied the yield and response to plant hormone applications in some varieties

of egg plant. Mehall & keten (275) 1972 studied the effect of applic ation of dinitroamilive on brinjal & tomato ; Totwani and Yadav (277) 1965 studied the effect of common funingants, Ethyline dichloride & carbon tetra chloride, on the germinability of seeds of brinjal tomato etc. The cultivation of different members of genus solanum has attracted attention of many scientists. William and Sistrunk (284) (1979) have studied the effect of cultivar irrigation and harvest date on th e yield of quality of tomatoes. Narang and kanwall (125) (1971) studied the effect of the soil moisture and different level of nitrogen and different spacing and the quality and yield of potatotuber. Rajput and Pandey (67) (1966) studied the plant population and time of transplanting and the growth and yield o f Brinjal. Gerakis and Tsangerakis (81) (1979) studied the effect of under ground mulches on the growth of under ground mulches on the growth of fruiting of egg plant. Goghalo (80) (1919) studied under which the saline water airrigation can be used for growing pototo plants. Saiginsilo (1983) studied the sowing qualities and productivity of seed and egg plant as a function of the maturity in the seed plant and the

time of harvesting. Vari (87) (1968) has descr-ibes the effect of differentiation in the availability wa water in the yield of egg plant. Foeldeisy and jesne (1969) has studied the chemical weed control with treflan in the cultivertion of S. laciniatum. Sza-bady (30) (1969) has studied that effect of steggard early sowaing and transplanting on the growth and development of S. laciniatium.

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Chapter 1·4

(7) Cytology Genetics Hybridization, and Mutation Breeding of Solanums:-

Cytology of non tuberiferous Spc. of Solanum has been studied by various worker, Kojima[59] 1926 Villmorine[24] and simonet 1927, Jorgenson[14] 1928 Bhaduri[5] 1933, Janakiammal[12] 1934, Sharma[21] 1959 Hardas[11] & Joshi 1954 Bayliss[4] 1954 Rai[17] 1959. Sorie and Heiser 1961. Heiser 1963, 1968, Mittra 1965. Rao 1967, Madhusudhanadvein 1968 D'Arcy 1969. Husain & Khan 1970, Averett and Powel 1972. Have all studied the cytology & facilitated our understanding of the variation of chromosome no. and concluded that in majority of non tuberiferous form the basic chromosome nopis 12. But Madhavean and Heiser 1972 indicated the existence of basic chromosomes no of 11 in S. Mumosum. The chromosomes of solanums are comparatively very small in size. There-fore the morphology of chromosome is difficult to study. Janakiammal 1934 recognised 5 types of chromos in the somatic cells of Brinjal Ellison[242] 1936 studied the bivalents of Hexaploid S.Nigrum and found 12 or 6 as basic no. Venkateshwalu[91] and Bhirava Murti 1969 studied pachytin chromosome of the diploid S.nigrum .

The tuber bearing solanum forms a polyploid series with 2n chromosomes no. as 24, 36, 48, 60, 72, the basic chromoson no. being 12 in potato, According to Averett & Powell[201] 1972 the basic chromosome no. in solanum is 12 sat chromosomes were reported by oinuma 1945 in S.seaforthianum and S.verbesci-folium. Sinha[49] 1975 has reported presence of one pair of sat chromosome in S.seaforthianum and S. verrucosum and two pairs of sat chromosome in S. Jerozewiczii. Douce 1972 had studied in tect mi[6]chondria of S.tuberosum.

Meiotic studies in solanums have been done by Kojima[59] 1925 and Janaki Ammal 1934 they have reported 12 bivalent egg plant, and se et diakinesis & Metaphase I in egg plant, and complete terminalization of short chromosome & gradual terminalization of medicine and long chromosomes et diplotene stage D'Arcy[209,220,221] 1974 studied Meiosis in several spe. of solanum and Kirti[15] & Rao studied 1978 studied Meosis in terespecific hybrids of spinus solanum. Rao[18] & Bakhshi 1979 studied the Meosis of 4 varieties of S.melongena & of the wild spe. S.integrifolium Hoglund[97] 1970 studied meosis in S.phureja and in the hybrid of S.tuberosum X . S. phureja Ellison[248] 1936 studied

the meosis in S. nitidi beccetum. Jenekiemal 1954 reported triplidy in the hybrid population of cross between two varieties of S. melongena and also reported 5 types of chromosomes with medium centromeres. Fukimato (258) 1962 studied the nuclear instability and Chromosomal mosaicism in colchicine induced poly ploids of S. integrifoliurn Howard (137) 1969 studied the meosis triplidy, dihaploidy and pachytin analysis of S. tuberosum. Larsen (259) 1943 studidd the polypoidy in the genus solemin Hermsen (230,245) 19 70 reported aneuploids from natural and colchicine induced autotetra ploids in S. melongena as well as S. tuberusum groups Lam and Erickson (182) 1970 reported presence of trisomic of a oliploid potato Hawkes (166) 1979 discussed the nature of polyploidy series in different groups .

Genetic studies, variability and heritability studies of qualitative and. quantitative characters has been done by Gotoh[9] 1953 and 1956. Dhesi[8] Nandpuri Chaliwal 1964 investigated the heritibility of a No. of characters while Sinha, parkash and Haque 1966 b studied genetic coeficient of variation, heritability estimates and genetic advances in egg plant Baha - eldin S.A. Blackhurst[3] and Perry 1968 c investigated simple and partial corelation coefficient among 6 plants characters of interveiectals hybrids of brinjal. Bhutani[6] Singh and Kalloo 1977 published

a note con variability studies in brinjal. Nowah 1969 studied variation in local and exotic variety of egg plant Singh 1974 investigated genetic variability Heritability and genetic advance in brinjal sinha (49,5) 1966 also made Heritability studies in brinjal.

Inheritance of colour in brinjal was studied by Tate[23] by 1939 Sambandam[19] 1962, 6,4, Swamy Rao[22] 1970 and Wanjari and Khapri[25] 1977 Inheritence of colour was also studied by Nalla 1932 in egg plant. Gaur (104) 1978 has studied character association in pota o Abdalla (186) 1971 studied inheritance of plant hieght and flowering time in wild potato in S. Verrocosum. Avdeev[132] 1971 studied inheritence of some properties in F_1 hybrid cross S. tuberusum with S. Gibberulusum Peter and Singh (35) 1973 made diallele analysis of economic trade in brinjal. Mick (270) 1972 studied s eggregation and recombination in back cross derivatives of t ometo spp hybrids sil vetti and Brunelli[48] 1971 devised a simple method for the genetic studies of variety of egg plant Abdull ez (231) 1972 studied cytogenetic auspect of the assortment of characters in Solanums. Choudhuri (46) 1972 made genetical studies in some. West African brinjal and brinjal Hybrid. Hamanna and Hermsen (238) 1979 studied genome relationship in tuber

bearing solanums. Male sterility in brinjal was reported by Jos mino 1956 and Singh and Khanna[20] 1964 Nakamura 1954 induced male sterility in brinjal by treating plant with amino salt of 2-4 D. Hebile and Swamy Rao[10] 1973 noticed cases of spontaneous male sterility in brinjal S. integrifolum.[a] Abdalla and Hermsen (279) 1972 studied plasmones and male sterility tupe in S. verrocosum. Studies in intervarietal hybridisation in potato have been made by Baily and Munsum (see sambaden 1962 in USA). Intervaretal hybridization in India were make egg plant by Pal Singh 1976 Misra 1961 Singh and Singh 1968 (a) Dutt 1970.

G opimony (39) Srinivasan 1972 crossed S. melogea with the w ild brinjal variety. S. melogene var. Insanum the hybrid shows heterosesin length of branches and no. of fruits per plant. Kakizaki (38 54) 1930 had earlier made the practical use of hybrid vigourxi shows vigour in the intervaietal hybrid of egg plant in Japan Haddi (141) 1976 tried to hybridize in vitro the tuberviroid to cellular DNA in potato. Timoshinko and Vesalovos Kil (102) 1972 studied the inheritence of ec economic and biological characters of potato in inter varietent crosses intraspecific variation and intr- aspecific hybridisation in S. Leoinetdm.

Inter specific[p] hybridization has been done non tuber ferous spe of solanum (Swamynathan 1949) Mittal 1950, Bhaduri 1961, Megoome Ramanujan

Cooper 1962 and Ludilov 1973). Khan Rao 1976 and Rasood Bakhsh 1978 and 1979 have obtained sterile hybrid from the crosses between 4 varieties of brinjal and S. integrifolium. Gerasimenkoe 1971 studied Daniel (259) 1920 had tried to hybridized egg plant with the help of grefting Rajasekaran (281) 1971 procuded amphidiploid from inter specific cross S. xanthocar Pum X S. metongine. Rao 1979 studied the beriers of hybridization in the cross between S. melongena and other related spc. of solanum. Siggerson (252) 1972 studied interspecific crosses in the genus solanum to obtained potato seedling resistance to virus Y. Vainanova 1976 made crosses between S. tuberosum and related wild spc.for breeding potato with higher content of dry matter. Rubensose and Margarita (108) 1972 used dihaploids for breeding S. tuberosum. Lever (179) 1970 has reported the source for chipping potatoes from an interspecific hybrid of S. Phureja and S. tuberosum. Kryuchkova (107) 1973 studies theeffectivity of increasing the yield inpotato by crossing it with diploid spc. Bukasov and Camaraz(167) 1975 studied the breeding of potato resistant to fungi bacteria viruses and yield worms.

Induction of mutation and mutation breeding of crop plants started only in late thirties. Dhanakaran 1935 studied the effect of some mutagenic radiation on crop plants. Averbach, Robson and coFr[2] 1947 used chemical mutagens for the production of mutation. Ada[1] 1976 studies mutagenic effects of Deanems. Denko[7] Janak and Smolko 1966 studied roadiation genetics and its practical suspects X rays & r rays both found to be effective mutagens. Ramaswamy & Sayed 1977 studies effect of r- rays on egg plant. Koer (153) 1967 induced mutations in potato by r- ray radiation Kaiman and Yarvok (145) Yul 1967 obtained dihaploid S. tuberosum from r- irradiation of seeds Horitsu (118,156) 1968 studied cobalt 60 r- ray irradiation on structure of starch grains in potato. Shaid rov (172) 1971 studied radio sensivily of potato to r- rays Mezentsev (146-157) 1970 studied the effect of r-irradiation. On the frequency of chromoson abbration in potato Veckerk (266) 1969 induced easy pealing & oblong fruit mutant in potato through. Irradiation. Mezentsev 1972 produced somatic mutation of potato by means of electron X rays, r rays. Pupova & petrol 1973 induced heterosis in egg plat thwough ultraviolet irradiation Andrvskil (65) 1971 used many chemical mutagens formutation breeing in egg plant Bharti (22) 1972 reported production of curved spine mutant in S. Khasianum induced by r-radiation Morrly and Pal(7) 1966 establish

relation ship between radiation those and lithality of diploids in solanum. Kaki zaki (38) 1931 had shidied hybrid vigour in the in tervariaal of egg plant Kadatka 1937 had studied the hybrid vigor of egg plats of hybrid as deleted of egg and seeds Pra sad and Prakash[16] 1966 had sindia hetrosis inter variatal of hybrids of egg plant.

Row 1972 studied genome differencetion in the hybrid between the S. gracevice and S. Noid florum Umuchkova[210] 1977 studied t he formation cametic bogeny sheremik plants of S. Nigrum and tomato venkatiswar and Krishna Row, 1972 studied breeding system mechanism and cro s s asiloty relationship and isolating mechenism in the S. Nigrum complex. Ugant 1970 studied the evolution and tetraploids in potato to from S. sterootmum and S. Spersipulum Anderson 1977 studied variation evolution of selected spe. of solanum. Bukasov (III) 1970 stdied the cytogenetics basis of evolution of potato species Grun (130) 1977 studied evolution of cytoplasmic factor in tetraploid cultivated potatoes Grun 1970 desicibed changes of cytoplasmic factors during the evolution of cultivated potato Grun 1979 gave(11) general surveyof the evolution of enthivated potato baseupon

cyto plasmic analysis.

Pall and Taller (68) 1969 studied the effects of pulination method on fertilization and egg plants G. Jyotishi and Husain (53) 1900 used [illegible] as an and in the brunjal hybrid seed production. Grum and ohi (148), 1978 produce new breed of [illegible], from the protoplasm culture.

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Chapter 1.5

DISEASES & MINOR RELATIVES

Solanum suffers from large numbers of diseases caused by fungi Bacteria viruses and insects pests. These diseases mainly attack the important crop plants like solanum melongene (brinjal) and solanum tuberosum (Potato) much workhave been done of these diseases and pests.

Brinjal suffers from nearly twenty diseases caused by fungi which damaged the crops. Fungal infection is mostly carried through seeds soverel leaf blight and fruit is caused by Phomopsis (Vexans). The disease caused complete rotting of fruit. This blight can be controlled by hot water treatment of seed. Damping off of seedlings is caused in nurseries by Rhizoctonia solania and Pythium aphani & ernatium. Myrothisium roridum kills brinjal seeding in two to three weeks. Different spe of Phytopthre caused water soaked patches on stems and fruits. These organism can be destroyed by used of fungicide like corocox or thorough desinfection of surface soil. Alternaria corcospora spe. caused leaf spot in brinjal. And from leaf spread to fruit which is unfit for consamption. Spray of bordeus mixture fortedon control the diseses. Root rot and fruit rot is caused by Rhizoctina solaniand

fusarium spp. Seed treatment with organic control this.

Virus disease has also been reported to infect the brinjal crop of this brinjal mosaic virus occur both in winter and summer crop. The leaf show mild mosaic motting of light yellow and green areas. The diseased plant bears smaller leaves and fewer fruits. The other virus disease is caused by little leaf virus and is more frequent in summer and rainy season crop the leaf also in rodice tuft of very small leaves are found in axil of leaves such plant do not bear in fruit. The disease spread more rapidly when weather is dry. Spraying of plant with DDT and BHC must control the disease to some extent. The roots of brinjal and damage by root knot nematode Meloidogyne. Virus and Eelworms (Heterodorespe) those nematode caused swelling on the roots although the plants are not killed they do not bear fruits the fumigants like DD thyline dichromite and carbon tetrachloride before planting and sowing stop the infection shoot fruits leaves are attached by many insects in brinjal. Epilcna spe. Leucinodes orbonalis and Amsacta particella are the most common

pest of shoot and fruits. These largely bore in to shoots and fruits and caused considerably loss. Caterpillars of brinjal leaf-roller Eublemma olivacea large themselves in the field and field in the field. The effective leaf whether and dry up. Spraying of the plants leaf chemical like Metablo DDT controls diseases. The Bandi Jalid has explained the brinjal crop, the such the leaf muck and the effected plant remain stunted many whids also effects brinjal causing the damin of the leaf of seed and white patches on the leaf. The epilachna Cossyli is very high. The plants appears as a white powder certain bottle and bulbs and urinting Cohmus destroyed the brinjal crop sucking the coop and leaf which together, with the black sooty like excrete of the insects gives rotties to leaf. Leaf sprayed have controled it brinjal beetle, Epilachna vigatioct opunctis. If the leaves of the plants the adults are groundish pail red with a number of black spot. They caused considerable to leaf. spraying with the DDT.

The large number of diseases and insect pests of brinjal have been reported from time to time. Some of them proved to be more damaging than another to brinjals. Many workers in many countries of the world

have been trying to reduce disease and insect resistance variety of plant. They have studied insect resistance of wilt disease of solanum species.

Banerji and Basu[2] (1956) Kalov[4] (1967) Anjaneyulu and Rama Krishna[1] (1968) Shri Nivasan, Gopi mohy[8] Swami Nathan and Pillai (1969) Sambandhan[70] and Chelliah and Natrajan (1969) Singh (1970)[71] Chelliah and Sambandham (1971) Singh and Pande, and Mahapatra Singh and Singh (1970), Singh Dalda Seith and Choudry (1972) Swami Nathan and Shri Nivasan (1972) Bindra and Sohi Khatri[35] (1972) Sambandham Natranjan Chelliah (1972) Dally (1973) Papaliotis (1973) Rao, Shomi and Das Gupta (1973) Chakraparthy nd choudry (1974)[57] Nasitch (1974) Verma and Chaudhry (1974) Khan, A. (1974) Krishnaiah, Tandon nel. Basad (1975) Cakaraberthy and Choudry 1975 Mayee and Khatri[5] (1975), Sahah, Stoner and webb and wintis[62] (1975), Mitra, Majumdhar and Parkas[6] (1976), Phamkher[75], Gupta and Kirti Singh (1977) and Nawanli and Sonkone[7] (1977).

Bindra, os and Sohim[53] (TN) 1968, Shri nivasan (PM) and Gowder (R. Sahttai) 1959, Has kall (RJ)[65] 19 21 Lismood JA 1970 Kodow, (KJ)[74] 1934 Singh, (DV) 1972 Sahr[42] (Alden) 1969 Rao and (D) Rajylakshmi[61] 1978. Sambadam[70] 1986, Mayee[75] 1977 and Dhenker, BS[73] 1977 are some

of the workers who have all worked on one or other aspect of diseased and pest resistance of brinjal and allied wild spc. They have found that wild spc. related to egg plant such as S. incanum S. integrifollium S. Khasianum, S. Hammosum S. torvum, S. iembrifolium, S. xanthocarpum. S. melongena. incanum and S. auriculatum are resistance to various disease and insect post Kaur Nith (1971) published a note on born diseases of brinjal Dubey 1975 studed fruit rot of Brinjal caused by corinespora cassiicola. Dubey and Singh 1976 studie studied wet rot of brinjals.

Banerji and Bedi 1936 studied the effectivity of insecticides against the shoot and fruit borer Diwan and Berry 1965 studied Persistance DDT and BHC residue on brinjal. Gaur and Tripathi (1979) studied carboferan residue in brinjal Bindra and Sohi Khattri 1972 studied the effect petetrac-ycline hydrochloride (Achromycine) on brinjal little leaf virus. Chakrabety and Sahi 1975 studied the breading of brinjal resistance to diseases in wild spc. was associated with high control of phenolic compounds or with high content of Ascorbic acid, Hayes and Khettri 1975 studied transmission of Brinjal Mos-aic Virus in some varieties of egg plant. Mittra, Mojumdar and Sarkas 1976 studied the effect of

little leaf disease on respiration and enzymatic activities in brinjal. Sehrawa 1976 studied the effect of different varities of egg plant verticillum dahlie (78) Khankher Gupta and Kirti 1977 studied the susceptibility the shoot and fruit borer Lucinodes orbonalis in brinjal and related wild spc. like S. sisymbrifolum. Nawale and sonum 1977 also studied he resistance to fruitand shootborer. Khan Rao and Dakh 1978 have shown the possibility of transfering post resistance gene from wild spc. S. integrifolium to the cultivated vairties of brinjal PPL allasa, Mahola and Sehi 1976 studied the wring r ot o f brinjal.

Gober Jyonti (Richard) (12) 1969 worked on the tobacco mosaic virus on S. Laciniatum, Kamya Zak 1972 (Francies Zak) worked on the chinochila wting worm of S. Laciniatum. A-argoa Rajan and Menulu (18) (1974) studied avirus causing mosaic disease in S. Khasia num Zadina(254) (1971) studied sensivity of several spc.of solanum to v-irus M. Macdonald (244)(1978) studied t he resistance of wild solanum clones to tetranychus urtice. Bowman and ross (1978) try to transfer major genes for resistance from deifferent vaieties of solanum like Varni S. Spergazinii and

S. oplocensees to cultivated varieties of brinjal eing 1973 studied the mode of transmission of S. torvum mosaic virus through aphis craccivora and aphis gossipi. Kobetaka 172 1970 studied the susceptibility of solanum to spotted wilt disease caused by virus. Opra 271 Hafila 1870 studied the control of the bacterial wilt of solanum caused by pseudomonas solanacearumin S. phrueja was studied by Howe and Luid 1970 and Howe 1972 [99] [50] Hemmna 1970 [100] studied the late blight resistance in the inter specific hybrid of some solanum. Gowda 218 1974 also worked on the bacterial wild of solanews caused by P. solanacearum Ori and Agrawal [4] 1971 isolated from S. jasminoides natura shoe. string virus. Belal saser (224) 1972 worked on the resistance to P. solanacearum in S. nigrum and S. surrense. Thakur and shastri, studied the symptomatology and properties of virus causing the mosaic disease of S. Khasianum Verma [17] 1972 reported that S. Khasianum is the host of many other mosaic viruses. Thompson [55] 1976 reported potato virus tobacco mosaic and tomato spotted virus cause severe diseases of S. Locianistum. Watson [5] 1976 studied the resistance of Phytophthora infestans in S. demissum Bruti (219) 1974 worked on the prevalence and host range of the root knot nematode Meloidogine incognita in the members of family solanace. Gaedon 1971 studied the

insectepicot of silvery night shade solanum eleagnifolium. S. tuberosum potato also suffere from a umber of diseases which are the main cause of loss of yield both infield and storage. The diseases may be caused by fungi, viruses, mycoplasma and physiological factors most important fungal diseases of potato is late blight caused by phytophoroin-festans (Mitta 1952 - 64) This disease causes. The appearance of small brown sopt on leaf let more near the margin and the lesions rapidly increase inside and appear water soaked, profused sporangial masses in the form of whitish cotton growth appear around lesion and under surface of leaf. During reains the spores are washed down to soil and infect the tubers which show sunke purple spot on the tubers Rashkamath pateria 1965 Butt 1965 Mehtani and Rashkamath 1968 Sharma (Sd) 1970 have extensively studies the effect of this disease. On potato. Spraying of the crop with a.g. fungicide like dithane contain compound like brestan helps to control the disease many disease resistant varaities of potato have been evolved at CPRI of simla

The early blight of potato is cause by alternaria solanie. It is particulary serious spring crop. The disease appears on the leaves in the former small brown circular and irregular spots that are dry and brittle in comparision to large wet spot of late blight several spo. Coalsce together and cover a great

part of leaf let the former small brown circular and irregular spots that are dry and . rittly incomparision to to the large wet spot of late blight several spot coalesce dgether and cover a geator port of leaf let the diseas first affect lower leaf than extend upepor leaf t hen ultimately result in premature. Death of plant this diseas can be controlled by spraying dathane a week beforre normal time of apearance of diseas.

The leaf blotch disease of potato is caused by cercospora concors in the cool and humid higher hills this disease also first appear on lower leaf and successively progresses to the upper leaves. The spot has no definite out line and symptoms vary in different varieties.

In most of varities light green to yellowish green spot appear on the upper surface of leaf. Then these spot become brown and appear angular in some varieties the spot become purple on the ventral sufase of leaf also light green lesion appear corresponding to lesions on the upper they become light violant then becare greish voliet. This diseas causes premature death of plant

Black scurf is caused by Rhizoctonia solanii It is periticularly sever in sandy soil and spring. Crops brownish black sclerotia on the tubes ongermination produce diseased phant which easily dies. Thus this diseaseis both tuber born and soil born.

Charcoal rot is caused by Macrophomina phaseoli. The pathogen is present in soil and infect the tubers. In itialy smally black spots apear around the lenticelle and eyes. Later the black patched become root and sub tuber begins to rot. The disease is very sever during hot season. Sclerotium tuber rot isoncused by sclerotium-Rolfsii which affect the plants and tubers both. This diseas is serious in warm and dry wether may reduce yield and cause havey loss due to rottage of tubers. A effected plant willit the collar region get covered by thick hyphe of fungus of stem root and surrounding soil get coverd by thick hyphae of fungus tuber get infection in the soil as well as harvest. The affective tuber start rotting. Pahuria 1961 Dutt 1962 Duttetal 196., 1970. Azariah and Rai 1970. Rao and Dass 1968 Sengupta and Dass196.. Chattopadhye 1967 Apparaxet at 1966. Dutt and Naga 1969, Dutt Thimu, Malaster 1955. Neuhusing 1964, Sharma and Sohi 1965

Thiromalachar Pushkar Nath 1955, Sahi etal 1970 Dutt Sheoraj 1970 Dutt and Pushkarnath 1960. Phadtar and Dharma 1971 Deastur 1950, Butter Bishy and Wasudeva 1967 and Sahoi 1976 are some of the important workers who have worked on fungal diseases of S. tuberosum.

Brown rot is the bacterial disease of potato caused by pseudomonas solanacearum. The plant start wilting and dies. Mases produce a toxic substance in plant which causes its death the bacterium is confined to vascular bundles of root stole on and stem which ultimately turn brown when affected part are cut the bacterialmass come out as white slimy fluid brown circular rings and found intuber in region between cortex and medulla in wet soil the tubers soard rotting in field the disease is carried through seed tubers and contaminated soil. To prevent filed infection proper drenge of soil should be insure. Solely fillied ring rot of potato isocused by corny bacterium sepedonicum . oft rot of potato is caused by erwinia carotovora. The affected plan turns green or yellow and some wilts and die. The halums become black in colours at level of soil. The cortial tissue of basal stem become black and shrivelled. The stubers are attack all stages of development. In

storage the bacteria caused soursoot of tubers resulting in great loss. Common scabis cause by streptomyces scabies. This disfigures the tubers and on the surface of tuber cavities appears. The pathogenis both tuber and soilborn. Harikishore and Pushker Nath 1965 Hamawamy (64) 1965. Kenge Gumy 1966. Hingorani and Mty 1962. Paharia and Pushkarnath 1965 are some of the workers who studied bacterial disease of ptato.

Viral diseases are largely responsible for poor yield of potato the inddence of diseases is fairly high nearly 45 viruses infect potato some of viruses are mosaic and other are yellow viruses. In the mosaic virus di sean chlorophyll is lose in some areas of leaf resulting in the formation of mosaic pattern. The viruses are mostly transmitted by aphids. It is caused by severalal viruses. The mosaic may be saperniled mlled of leaf rolling, interveinal mothe cellicosefere mosaic leaf droprosaic. Yellowviruses include leaf role virus witchis broomvirus or purple top role.

No gaich 1971 Vasudva and Ramamurti 1946 Vasudva and Gupta 1966, Sharma and Ray Choudhry 1962 Verma[17] etal 1990 upreti etal. 1989 negelon and Agraval 1959

Negolch Gri 1968 Vasudeva and Lal 1945 Negalch 1971 Negalch 1963 are some of the important workers who had studied Viraldisease of potato.

Kamaraz(162) 1975. has worked on resistent and potato to virus disease phytophora and Nematode Spencer's (161) (1974) has studied the pathogenecity of Rhizoctonia solanai to the potato plants. Pitt (1970) studied the changes in Ayurdiase activity of solanum tuber tissies during infection by Phytophthora. Erithyron septica. Aklyarova and yoshina (194) (1979) studied the inheritance of resistance to potato virus in solanum acaulovide. Pushnrenko and Skofskod(198) (1971)studied Glutamate decarboxy activity of plants infected with potato virus. Mellors and Smith (171) studied the potato leaf role virus. Lamb (191;2-6)1976 studied the effects of virus on S. Bulbocastanum. Ikeuniets (198) Ukr Academ (1971) studied virus of potato in U.S.R Vieder (176; 1970 studied the transmit resistance of soil potatoes to potato rots yield worms. Ciper and Lawrence (196) 1972 studied the scab resistance of some solanum. Tubero sum hybrid. Koch and Nixula (1971) has died the soilfreatment of root knot Nematodes on potato. Gospard and Gagula Negy(261)(1979) studied the resistant of solanum species and hybrid virus M Jame (200)(1971) evoluted a method used to estimate loss and yield of potato mallore and Reichards (153,186) (1970)

studied the virus strains A & S causing disease and potato Cockerhrin (197) (1970) made genetical studies n in potato on resistant to x and y viruses, Debok (1970) studied effect of temperature on the development local lesions in potato due to virus A Mac Ram (195) (1971) studied the techniques serulogical detection potato virus X Khesiazek (1976) studied spread of potato viruses of caused poloroda Bf. stace (1970) studied the radication of potato spindle tuber virus. Black (150) (1970) studied in potato the nature and inheritonde offield resistant to late blight peroblem (1972) devise a rapid method of detecting contamination of tuber virus by Irvine carotovore Allen and Foldmouser (119) (1971) studied the effect of alfa chekonine obtained from potato to controled free living of nematodes (114) (1974) studied soil fumigation and zinc status of soils in relation to potato speckle bottom disease Pentyukhona (159) (1976) tried to breed Nemetode resistant potato varieties, Ozerateskoayu (172) oiskaya 1976 studied vertical resistent of potato Phytophthora infestans. (6) Doboias (1976) studied the resistant in potato to black leg and tuber versession (204) (1976) detected the

presence of antimicrobial substances in potato plants. Varieties Jattala and robe (253) (1976) studied the reaction of many tuber bearing spe. of potato to root knot Nomatode walker (274) 1949 has studied disease resistance in potato to Phomoxis vexan.

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Chapter 1·6

CHEMICAL CONSTITUENT AND FOOD VALUE OF SOLANUMS

The Genus solenum is very rich source of large no. of alkaloids and carbohydrates. It is very important because the plants belonging to it are used as either staple diet or as vegetable ~~through-out-the~~or as sources of medicine Brinjal is used as vegetable through out the world if contains 91.5% water, 6.4% carbohydrates. 1.3% protein 0.3% fats 0.5% minerals matters like celcium, phosphorous etc. It also contains vitamins per 100 gm. of edible fruits as follows vit. A. 124 I.U., Thiamine 0.04 mg. Ribaflavin 0.11 mgm., Nicotinic acid 0.90 mgm., vitamin C 12 to 24 mgm. and coline 5,200 mgm. (Chaddah 1972). The protein of fruits is 14-19% of dry wt. of fruits with following amoino acids. Agginine, Histidine, Lysine, Tryptophane phenylalenine, methionine, Threonine, Leveine, Isolevine and valive. The oil yield of dry seed is 21-22% sugars present are succorse glucose, fructose rhamnose. The bitter factor of fruits & leaves is alkaloids and glycoalkaloids are also present like solamodive. (Chadah[1] 1972) certain phenalic compounds like chlorogenic & neochlorogenic acid are abso present in plant

with maximum % in fruits. Dikle, Anikenko & studentsova 1978 have given the detailed chemical composi -tio n of fruits.

Besides being used as vegetables brinjals are consumed in a variety of ways. Roasted in hot ashes mashed and seasoned with salt onion chillies and lime juice are curd & musterd oil they are made into Bharta, relitioed in India they are also picked They have high vegetable value during with They are eaten when app. roachingripen Brinjal roots are used as Asthama Leaves are used in chlorea & Bronchites also used in lever complains & seeds are stimulents. Poly phenolase are also extracted from the fruits.

S.tuberosum is also consumed as food all over the world. Cooked potatoes are the staple diets of a g great past of the white world they are also used as raw materials for manufacture of starch, ethyl alchohol & many other industrial compounds In fresh potato moisture is 77% protein 2% Ether 1% and other carbohydrates nearly 19% ca, phosphoms & Fe are present in the tubers besides magnesium potassium, Na Cu, S, Cl, Mn, Zn. 65 to 80 % of dry wt of potato is starch freshly harvested potatohave small quantity of sugars but on

storage amount of sugars increase upto 10% Fructose is the main su gar present in it sucorse glucose and la large no of other sugars are also present 1% of carbohydeate is from of he cellulose, celluere & pectic substances. Nitrogen contents of potato varieus from 1.2 to 2% of dry wt. Essential emoino acids like arginine, Histr dine, Lycine, Tryptophave phenyl elenine. Cystine Methioning thrionine, valine are present. Chanddeh (1978) Many org acds phenolic compounds like chlorogenic acid and colouring matters like anthocenins an flavonols are present beside chlorophyll. Alkaloid like solanum and solanidine are also present.

S.nigrum complex has a minor food value as ripe fruit are erten and used in preparation of Jams. They are also used as colovrent for sauces and fruit Juces but most important use is in medicine stem leaves unripe fruits arexused for treatmt of various dieses & ailment infusion & decoction are used in abdominal troubles & also as a depressents. Alkaloids are also reported in theire roots. Some spc. of S. nigrum are very poisonous & may cause disease in children & cattle. Ripe fruits are rich source of glucose, fructose vit. C and carotins. Glycoalkaloids are also extracted from the fruits of the plants belonging to

this group. Segal (1978) has worked on the from ation of solasidine under conditions of sapogenins hydrolysis. Bernath and Titeny (31) (1978) has studied steriodal alkaloids of S.Laciniatum. Thése alkaloids of solanumhas also been studied by schrieber (1978) Bradly (234) (1978) and Roddick (233) (1978) Bhatt (21) (1978) INKANSAGAR and Pinger (1977) have worked on alkolids of solenum khasium & S.Viruvm, Nish (202) 1976 and Coune (215) 1977, Zaitchek and Segal (223) 1972, Daroczy and Hermady (1) 1971 have worked on the alkaloids of the genus solanum. Mathe and Mathe (8) 1979. 1971-72 and have worked on the alkaloids of S.dulcamara. Miller & Davis(20) 1979 studied solasidine accumulation in some wild spc. of solanum. Evares (1978) has worked on tropene alkaloids of solanaceae.

Bokarave and Ivonova 1970 1971 has worked on cohlline an Betain obtained from potato leaves. Harborne (210) 1979 has worked on falvanoids of solanacea, Toyiok (187) 1970 have studied poly isoprenoids extracted from potato leaves. Varshney & Khan (15) 1971 studied chemically the fruits & stems of S.Indicum Bedi (19) 1971 worked on the fat content of seed of S. khasianum. Gallaird (168) 1971. worked

on the fat content of seed of S. khasianum. Gallaird ((168) 1971 studied activity of potato enzymes & galacto lipids. Wood & siddiqui 19 isolated & studied soluble galactane obtained from potato tuber. Rama Swmy & Ragoy (64) 1972 studied the hydroxy glucotonic acid obtained from brinjal. Kaldy (101) 1972 Kubicz and Morewiecka (170) 1971 and stegemann 1979 worked on the protens & amoina acid found in potato parmal 1982 , Henhstn 1985 and Patel (225) 1972 etum have worked on the poisan & toxhcity of some night shade spe.

Reference

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LIST OF PERIODICALS

Abbrivistion	FULL NAME	PLACE	FREQUENCY
1. Acta Biochem. Biophy. Acad. Sci. Hung.	Acta Biochemica ET Biophysica Academy Science.	Hungary	Quaterly
2. Acta. Bot. Acad. Sci. Hung.	Acta. Botanica academy of Science.	"	4/year
3. Acta Crystallogr.	Acta crystalcographica	Denmark	Monthly
4. Acta. Soc. Bot. pol.	Acta Societatis Botanicorum Polanial.	Poland	Quaterly
5. Agri. Res. J.Kerala	Agriculture Research Journal	Kerala	Vol 4
6. Agrokhim	Agrokhimiya	U.S.S.R.	Monthly
7. Agro Plante	Agroplante	South Africa	Quaterly
8. Amer. J. Bot.	American Journal of Botany	Ohio	10/years.
9. Amer. J. Pharm.	American Jurnal of Pharmaceutical	U.S.	5/year
10. Amer.J.Potato	American Jurnal of Potato	New Brunswick	Monthly
11. Ann. Agr. Fenn.	Annales Agricultural Fennial	Finland	4-6/year
12. Ann. App. Biol.	Annales of Applied Biology.	Warwick	9/year
13. Ann. Phytopath. Soc Jpn.	Annales of phytopathology society of Japan.	Japan	5/year
14. Ann. Ro. Bot Gard.	Annals of Royal Botanica Garden.	Calcutta	4/years
15. Ann. Review of Phytopath.	Annual Review of Phytopathology.	U.S.	Monthly
16. Arch. Pharm.	Archives internationals dephamecodynamic.	Bruxelles	"

1	2	3	4
17. Biochem. Biophys Acta	Biochemica BT. Biophysica Acta.	Amsterdam	12$/Year
18. Biologia.	Biologia.	Hungery.	Twice annualy
19. Biol. Plant.	Biologia Plantarum	ezechoso-Vakia	Bimonthly
20. Biol Zentralbl.	Biologisches Zentral Blat.	Germany East	"
21. Bot. Gazzett.	Botanical Gazzettes	U.S.	Quaterly
22. Bot. J. Linn. Soc.	Botanical Journal of Linneous society	"	Monthly
23. Bot. Mag.	Botanical Magzine	Tokoyo.	quartly
24. Bot. Rev.	Botanical Review	U.S.	"
25. Bot. Soc. Argent. Bot.	Botanical Society Argentina Botany.	Argentina	Monthly
26. Bot. Zh.	Botanicheskii Zhurnal	Moscow	"
27. Brittion.	Brittonia	New York	Quaterly
28. Can. J. Bot.	Canadian Journal of Botany.	Canada	Monthly
29. Can. J. Gent.	Canadian. Journal of Genetics	Ottawa	Quaterly
30. Can. J. Genet. Cytol.	Canadian Journal of Genetics	Canada	"
31. Caryologia	Caryologia	Pisa	4/Yr.
32. Cytologia	Cytologia	Tokoyo	Quaterly
33. Comp. Rend. Acad Sci.	Comples Rendus Academic Sciences.	Paris	Irregular
34. Curr. Sci.	Current Science	Banglore	Irregular
35. Dis. Pharm. Pharmacol.	Dissertation Pharmaceutical Pharmacologia	Warsaw	Bimonthly
36. Dokl Akad. Nauk Azss	Doklady Ajdemii Nauke	U.S.S.R.	Bimonthly

1	2	3	4
37. East Apl. Agr. Forest.J.	East African Agricultural and Forestry Journal	Kenya	Quaterly
38. Environ. Exp. Bot.	Environmental and Experimental Botany	Blamsford	*
39. Euphy.	Euphytica	Wageningen	3/Yr.
40 Fiziol Rast	Fiziologia Rastenii	U.S.S.R*	Bimonthly
41. Flora.	Flora.	U.K.	Bimonthly
42. Food Cosmet Toxicol.	Food and Cosmetics Toxicology.	Blamsford	*
43. Genetica	Genetica	Hague	3/Yr.
44. Genetics	Genetics	U.S.	Monthly
45. Genet Agr.	Genetica Agraria	Italy	Quaterly
46. Haryana. J. of Hortic. Sci.	Haryana Journal of Horticulture Science.	Haryana	Monthly
47. Herba Hung.	Herba Hungaria	Budakalzy	3 year
48. Heriditas.	Heriditas.	Switzerland	Quaterly
49. Heridity.	Heridity	U.P.	Bimonthly
50. Hort. Res.	Horticulture Research	U.K.	2/Yr.
51. Ice Land Bull.	Ice land statistical Billetin	Ice land	Quaterly
52. Ind.J.Ento.	Indian Journal of Entomology	Delhi	*
53. Ind. J. Exp. Biol.	Indian Journal of Experimental Biology	*	Monthly
54. Ind. J. Gent.	Indian Journal of Genetics and Plant breeding.	N.Delhi	3/Yr.
55. Ind. J.Hort. Sci.	Indian Journal of Horticultural	Banglore	Quterly
56. Ind.J.Mycol.Plant Patho.	Indian Journal of Mycology and plant pathology	Udaipur.	Twice Monthly

1	2	3	4
57. Indi.Phytopath.	Indian Phytopathology	N.Delhi	Quaterly
58. Indian. J. Ento	Indian Journal Entomology	Delhi	"
59. Indian. J. or Pt Patho.	Indian Journal of plant Pathology	Delhi	Monthly
60. Ind. J. or pharm.	Indian Journal of plant pathology pharmacy	Bombay	Bimonthly
61. Iran.J.Plant path.	Iranian Journal of Plant pathology	Tehran	Quaterly
62. J.Econ. Entrol.	Jurnal of Economic Entomology	U.S.A.	Bimonthly
63. J.Food. Sci.	Journal of food Science	"	"
64. J. Genet.	Journal of Genetics	Hydrabad	Irregular.
65. J.Agric. Res	Journal of Agricultural Research	U.K.	Quaterly
66. J. of Sci. of food and agric.	Journal of Science of food and Agriculture.	"	Monthly
67. J.Nemato.	Journal of Nematology	U.S.	Quaterly
68. J.Pharm. Sci.	Journal of Pharmaceutical sciences	"	Monthly
69. J. Res. Pubjab. Agri. Univ.	Journal of Research Pubjab Agriculture University Pubjab.	Punjab	"
70. J. Res. Chi.	Journal of Research Science.	U.S.	Monthly
71. Jap. J. Bot.	Japanese Journal of Botany	Tokoyo	"
72. Jap. J.Breed.	Japanse journal of Breeding	"	Bimonthly
73. J. of Heri	Journal of Heridity.	U.S.	"
74. Khim. prir. Soedin.	Khimiye prirodnykh soedinenii	Tashkent	"
75. Kosm. Biol. Mid.	Kosmicheskaya Biologiya Medistina	Moscow	Bimonthly

1	2	3	4
76. Lloydia	Lloydia	Ohio	Quaterly
77. Mikro. Biol.Mid.	Mickrobiologichnyi zhurnal	U.S.S.R	Bimonthly
78. Mol. Gen. Gent.	Molecular and general Genetic	U.S	6v/Year
79. Nematologia	Nematologia	Leiden	4/Year
80. New Bot	New Botanist	N.Delhi	Quaterly
81. Pharm. Weekly	Pharma eological weekly	U.S.	Monthly
82. Phyto chemistry	Phytophathology	Oxford	"
82. Phyto Pathol	Phytopathology	Oxford U.S	"
84. phyto pathol Mediterr.	Phytopathology Mediterrian	U.K.	Bimonthly
85. Phytopatho.Zh.	Phytopathology Zhurnal	U.S.S.R	"
86. Pl. Breed.	Plant Breeding	Cambridge	Monthly
87. Planta	Planta	Berlin	8v/Year
88. Pl. Dis. Rep.	Plant Disease Reporter	U.S.	Monthly
89. Plant. Med.	Planta Medica	Stuttgart	"
90. Potato Research	Potato Research.	Wageninger	Quaterly
91. Proc.I.Nat Sci. Aca.	Proceding Natural Science Academy	U.S.	Irregular
92. Proc. Of Amer Soc. For Hort.	Proceeding of American Society for Horticulture Science	"	Yearly
93. Prog. Hort	Progressive Horticulture	Lucknow	Quaterly
94. Plant Cell. Physio	Plant Cell Physiology	Japan	Bimonthly
95. Q.Plant.food.Hum Nut.	Qualitas Plantarum/ Plant food Human nutrition	Neitherland	4/Year.
96. Qut. J. Crud. Drug. Res.	Quaterly Jaimal of crude drug Research.	Lisse	Irregular
97. Queen's Land Herb.	Queen's Land Herbarium	U.S.S.R.	6/Year
98. Rast. Resur.	Rastitelnye Resursy	Moscow	Quaterly

1	2	3	4
99. Referat. Zhurnal.	Referativnyi Zhurnal	U.S.S.R.	Monthly
100. Res. Comm. Chem. pathol Pharmacol.	Research communication in chemical Pathology and Pharmacology.	U.S.	"
101. Seed Sci. Tech.	Seed Science and Technology.	Norway	Quaterly
102. Sida contrb. Bot.	Sida contribution to Botany	Dallas	2/year
103. Sym. Canada.	Symposium. Canada.	Canada	Irregular
104. Weed Sci.	Weed Science	U.K.	Bimonthly
105. Z. P. flanzen.	Zhurnal of plantzen phyeiology	U.S.S.R.	Monthly

LIST OF ABBREVIATIONS

AA	=	Acetic acid
ABA	=	Abaisic Acid
AC	=	Acetylcholine Chloride
ADP	=	Adenosine diphosphate
Al	=	Aliminium
B	=	Boron
B	=	Beete
C	=	Carbon
Co	=	degree centigrade
Ca	=	Calcium
CC	=	Choline Chloride
Chemi	=	Chemicals
Colch	=	Colchicine
Conc	=	Concentration
COA	=	Acetyl Coenzyme A
CMV	=	Mosaic Virus
D-D	=	Dichloropropene-dichloroprpene
Dec	=	December
Dev	=	Development
Dise	=	Disease
DNA	=	Dicarbo Oxalic nucleic acid
Ed	=	Editor
F_1	=	First filiale Generation
F^0	=	Degree feran hite.

Fe	=	(Ferum) Iron
Feb	=	February
ft	=	Feet
G-6-P	=	Glucose-6-Phosphate
GA	=	Gibberellic Aid
Gen	=	Genus
Gibb	=	Gibberellin
Glue	=	Glucose
gm	=	gram
H_2SO_4	=	Sulphuric acid
Hcl	=	Hydrogen Chloride
h-days	=	hours-days
hybr	=	hybrid
IAA	=	Indole acetic acid
J an	=	January
K	=	Potassium
Kg/ha	=	Kilogram per hectare
Kcl	=	Potassium Chloride
L	=	Lycopersicon
Li	=	Lima
mg	=	miligram
mg/Kg	=	miligram per Kilogram
min	=	Minites
mm	=	mili meter
mo	=	month
Mg	=	Magnessium
Mut	=	Mutagens
N	=	Nitrogen
NP	=	Nitrogen phosphate

$(NH_4)_2 SO_4$	=	Ammonium sulphate
NO_2	=	Nitrogen oxide
No	=	Number
P	=	Phosphorous
PPH	=	Plant per hectare
Ph	=	Phaseolous
P	=	Pseudomonas
Ppm	=	Partper million
PSTV	=	Potato Spin-dle tuber virus
Rb	=	Rubidium
Rep	=	Reproduction
Rh	=	Rhizoctinia
S	=	Solanum
Sect	=	Section
Solasd	=	Solasodine
Spc	=	Species
Subspc	=	Sub species
T	=	Tall
t	=	Dwarf
TMV	=	Tobacco Mosaic Vims
Var	=	Variety
Veg	=	Vegetables
WK	=	Week
X	=	X ray
Zn	=	Zink
Murea	=	Million Urea
10^{-3} M	=	10^{-3} Million

R dose	=	Radiation dose
K	=	Alfa
3rd gen	=	third generation
r	=	Gamma Ray
%	=	Percentage
ton/acre	=	Ton per acre
60 co	=	60 Cogamma
lb	=	Pound
:	=	Ratio

PART TWO

BIBLIOGRAPHY

CHAPTER

BIBLIOGRAPHY WITH ANNOTATIONS

ALKALOIDS - EFFECTS OF GLUCOCORTICOID

1. DAROCZY (A) and HERNADI (F). On the glucocorticoid like effects of the solanum alkaloids. Acta Biochim Biophys. Acad Sci Hung. 6,4; 1971; 327-31.

The effect of a few solanum alkaloids was investigated on the inducible tryptophan pyrrolase synthesis in the liver of adrenalectomized and normal rats. The glucocorticoid like action of solanum alkaloids was mainly secondary, mediated through corticoids produced in the adrenals.

ANDIGENA - ROLE OF ROOT CYTOKININS

2. WOOLLEY (D J). Role of roots cytokinins and apical dominance in the control of lateral shoot form in S.andigena. Planta (Berl). 105,1; 1972; 33-42.

The lateral buds of S.andigena has the potentiality to develop as a stolon or as a leafy shoot. The presence of roots was found to be necessary for the conversion of a natural stolon to a leafy shoot but this root effect could be replaced by the synthetic cytokinin, 6 Benzylaminopurine (BAP).

DATURA - STUDY OF NEW VIRUS

3. GIRI (L) and AGARWAL (H O). Datura shoestring virus, a new virus isolated from Solanum Jasminoides. Phytopathology. N. 70,1; 1971; 81-83.

In Datura metal, the virus caused very severe leaf deformation; new leaves were reduced to shoestring like structures. This mechanically transferrable virus has small no. of host plants; Nicotinia tabacum N. Glutinosa N. rostica and datura metal.

DEMISSUM - PLANT PATHOGENS

4. WATSON (I A). Changes in virulence and population shift in plant pathogens. Ann review phytopath. 8; 1970; 224.

Many primitive and wild spe. have been sources of resistance to plant pathogen. They were recognised in the early stages. The genes. of S.Demissum and other spe. give a resistance to phytopthora infestans that is easily recognised and hence can be transferred to cultivated type. One clone of S.demissum for example had six genes for specific resistance as well as genes for non specific resistance.

DICOTYLEDONS - SHELLZONE

5. SHAH (J J) and PATEL (J D). Shell zone: Its differentiation and probable function in some dicotyledons. Am. J Bot. 59,7; 1972; 683-90.

In cuminum cyminum and ipomuea sairrica, the shell zone contributes in bringing about the axillary position of the bud from its early lateral position in solanum melongena, derivatines of the shell zone initiate the inter nodal elongation between the flower or inflorescence and the shoot apex, ultimately shifting the bud to an extra axilliary position on the internode.

DIPLOIDCLONES - RADIATION DOSERATE

6. MCCROREY (Gerard J) and PAUL (GRUSS). Relationship between radiation dose rate and lethality of diploid clones of Solanum. Radiol. Bot. 9,1; 1968 27-32.

A primilinary study was carried out to establish the relationship between dose rate and the lethal effect of $60^{0}C$ radiation clonal rooted cuttings of solanum were exposed to 9 K.R, a predicted lethal dose during 12 different periods. of time coresponding to dose rates of 225 OR/min. though a geometic progression to 1.09 R/min.

DULCAMERA - ALKALOID CONTENTS

7. MATHE (Imre) and IMRE (Mathe). The alkaloid contents of Solanum dulcamara L. Population in Hungary. Herba Hung 11,1; 1972; 5-12.

S. dulcamara L. plants through out Hungary contained Solaculaidine and solasodine soladulcin containing plants were found more frequently east of them West of the Danube. A North south differentiation in types amounts of alkaloides in plants was also observed. The alkaloid contents of S.dulcamara seemed to depend upon numerous external and internal factors.

8. TUKALO (E A) and IVANCHENKO (B T). Glycoside alkaloids from S.dulcamara. Khim prir Soedin (Tesk). 1,2; 1971; 207-8.

Two substances, C50 H83 No21 and C_{45} H 75 No_{16} were isolated and identified as α and β soladulcid. The first contains 2 molecules of D- galactose and D-xylose the second contain 1 molecule of D-glucose D-galactose and α - rhamnose.

VARIATION - ALKALOIDS

9. HAWKES (JG) and HAWKES (JR). Variation in alkaloids in Solanum dulcamara L. In Hawkes (JG) ed. Symposium on Biology and taxonomy of solanaceae (Birmingham) (1979) 7, 211-20.

In S.dulcamara L there are three main steroid alkaloids to natidenol, solasodine and soladulcidine, which occur in varying proportion in many glycosides. The predominantly to natidenol producing taxa tend to be pubescent and come from the humid climatic region of western Europe the soladulcidine producing taxa tendto be glabrous and occur in the drier climatic regions of eastern Europe, but this distinction is not sufficiently clear to support formal subspecific morphological division of this species.

SILVERLEAF NIGHTSHADE - INSECT ECOLOGY

10. GOODEN (Richard D). Insect ecology of silver leaf nightshade. Weed. Sci. 19,1; 1971; 45-51.

Two phytophagous insects associated with silver leaf nightshade (S. elaeagnifolium cav.) were surveyed in southern californie. The feasibility of biological control of silverleaf nightshade and the value of faunistic surveys in ascertaining the indigenous or alein status of plants are good.

EMBRYOGENESIS - BY POLLEN CULTURE

11. HELAC NIKOVA (Aurelia). Mechanism of embryogenesis induced by pollen anc cultivation in vitro. Biologia. 31,4; 1976; 301-9.

Literature on the problem of Pollen Embryogenesis is reviewed including a list of sp. in which it has been successfully induced. Members of the families Brassicaceae Cucurbitaceae, Liliaceae, Fabaceae, Solanaceae and Poaceae. Personal observation of Nicotiana tobacum indicated that normal embrys develop from pollen grains in which an ideally symmetrical division during the first mitosis occured, while varous types of abberant embros develop from mitosis with vering degrees of asymmetry embro-Genesis is endently independant of the cel us.

GRACILE AND HOMIFORM - CYTOLOGY-DIFFERENTIATION

12. RAO (N Krishna). Genome differentiation between Solanum gracile and S.nodiflorum. Cytologia 37,2; 1972; 305-8.

A hybrid between S.gracile naturalized in Newzeeland and an India race of S.nodiflorum had 84.3% pollen sterility, and did not set seed. Chromosome pairing observed at late diakinesis suggests that the genomes of 2 Spp. differ in at least 6 pairs of chromosomes and probably 2 of these 3 pairs are involved in a translocation for a short segment.

HYOSCYAMUS - EFFECTS OF NIGHT SHADE

14. PARMEL (V C H). Will night shade poison goslings. Veg. Acad. 17,467; 1982; 12.

Several kinds of night shade, S.Hyoscyamus and Datura are all poisonous. The author has had no experience with the effect of these on goslings. Night shade and Datura both are poisonous and dangerous to eat. Some time it is used for medicine both plants have medicinal value also used in bodeache and toothache also.

INDICUM - FRUITS AND STEMS - CHEMICAL EXAMINATION

15. VARSHNEY (I P) and KHAN (A A). Chemical examination of fruits and stems of solanum indicum L. Indian. J. pharm. 33,3; 1971; 49-50.

The fruits of Solanum indicum L. on extraction with petroleum ether gave B-sitosterol and with alchohal a mixture of alkaloids and saponins. The saponins on hydrolysis with H2 So4 gave a mixture of sapogenins, one of which was identified as diosgenin and the alkaloid mixture with HCl gave 2 2 aglycogens.

KHASIANUM - DISEASES

16. RAMARAJU (R) and CHENULU (V V). Studies on a virus inciting mosaic disease in Solanum Khasianum clarke. I.J. of Exp. Bio. 12,4; 1974; 356-358

The host range was restricted to solanaceae. Thermal inactivation point was 55-60°C dilution end point 1; 1000-1; 20°C, longivity in vitro 16-20h at room temp. (31 - 35,5°) and opt. PH 5 - 8. The purified virus was a flexuous rod, an. 755 x 15 m. The titre of anteserum with purified antigen and clarified infective sap was 1,256 and 1 ; 128 respectively. The virus is serologierlly related to potato virus. But differs from those infecting S. Spp. It is there fore considered to be new and designitated S. Khasinum mosaic virus.

— MEDICINAL VALUE

16. MATSUNGA (E Suzuki K) and SHINDO (N C). Studies on the cultivation of medicinal plants, New forms of S. Khasianum clertic in Japan. Syoyakugaku Zasshi 23,1; 1969; 24-27.

The new strain differs from the common one in the spines which occur on the leaves in extremely reduced numbers and disappear on the stems. The new strain is better in growth and yield than the common one with the former producing twice as many fruits as the latter. Analysis of both strains showed the presence of alkaloids in the berries at various fruiting stage but none in the roots stems or leaves.

17. VERMA (Virendra S). Two medicinal plants, Blumea lacera DC and Solanum Khasianum Cl; As additional hosts of certain plant Viruses. Phytopathol Mediterr. 11,1; 1972; 59-60.

S. Khasianum could be infected by 8 of the viruses tested B.M.V. Brinjal could infect both hosts where as mungnor bean mosaic virus could infect none delicos enation mosaic virus could infect S. Khasianum but not B. lacera.

— MOSIAC DISEASE

18. THAKUR (R N) and SASTRY (K S N). Studies on mosaic disease of S. Khasianum Indian phytopathol. 24,1; 1971; 127-30.

Symptomatology and properties of the virus of mosaic disease of S. Khasianum . Were studied the virus was inactivated on exposure to 60°C for 10 min and remained active up to a dilution of 1:1000. It survived 4 days storage at a temp. of 23 - 28°C beyond 14 days at 0°C more than 10 days on desiccation.

— SEED OIL COMPONENTS

19. SEN (K L) etc. Studies in Indian seeds oils. J. Sci. Food agr. Soi. 22,5; 1971; 140-42.

Percentage by weight of palmetic, stearic, oleic linoleic acids were determined in the seeds fats of crotalaria intermedia, Solanum Khasianum by Gas liquid chromatography. An unusual component in the 1st fat was 38.5% petros elinic acid and the 2nd 3.5% acetic acid. The other 8 fats contained higher chain length components.

-SOLASODINE CHARACTERISTICS

20. MILLER (Linda MF) and DAVIES (M E). Characteristics of solasodine accumulation in S. Khasianum. and S. Laciniatum. grown under field conditions in Bermingham. In HAWKES (J G) Eds. Symposiumon biology + taxomony of solanaceae (Birmingham) (1979), 251-55.

Seasonal variation in solasodine content was determined for S. Khasianum and S. Laciniatum. Grown under field condition. The results confirm the major differences in the pattern of accumulation reported for these two species the alkaloids being located solely in the berries of S. Khasianum and in both berries & foliage of S. Laciniatum . Solasodine concentration in individual organs are similar to those reported for plants grown at other Location.

-CONTENTS

21. BHATT. etc. Improvement of solasodine content in fruits of spiny and mutant tetraploids of Solanum Khasianum Environ. Exp. Bot. 18,2; 1978; 127-30.

Chemical analysis of fruits of a gamma-ray induced curved spine mutent its tetraploids and a spiny tetraploid of S. Khasianum revealed about 35-50% higher solasodine in the tetraploids than in the diploids. This superiority may arise from the additional heterozygosity introduced by the cumulative effects of colchicine and radiation.

-SPINE GAMA RADIATION

22. BHARATI (Bhatt). Curved spine mutant in S. Khasianum Clarke, In duced by r-radiation. Curr Sci. 41,24; 1972; 889-90.

Presence of sharp spines all over the aerial parts of the fruits. Dry seeds were irradiated with 5-35KR doses of 60Co r-rays and sown in pots. One of the M_2 progenies obtained having thick curved and blunt spines. Some variants with absolutely no spines were also obtained in M_2 but these were completely sterile. In amtotetraploids it was spineless.

LACINIATUM - HISTORY

25. MILLER (I B). Rambling among the night shades. Amer. J. Pharm. 97; 1925; 4-38.

In this article author states that interesting and valueable facts are brought about, in regard to the history of solerams (melonginer bolunum L.)

-CALLUS FORMATION

24. ALEKSEENKO (L). Callus formatim in the invitrotissue culture of S. Laciniatum. Biologie . 26,3; 1977; 208-11

When anthers of S. Laciniatum '306l' where cultured callus formed only when anthers containting pollen at the tetrad or Uninucleatestage were used and only when the nutrient medium contained glucose. The callus formed most rapidly and developed best on a medium containg 2mg/l kinetin, 2 mg/l I A A, 1% agar and 3% glucose.

-chemical COMPOSITION - VARIATION

25. GERASIMENKO (I I). Intra - speeds variation in the lobular nightshade (S. Laciniatum) Rest. Resur. 7,3, 1971; 365-71.

Intraspecific variation in Biology, Morphology and chemistry were found, Intraspeific hybridization of the five forms (X. fasmanicum Hirasimenko X nova X nova zilandicum Heras. & australine Hiras X cultum Hiras and X viridicoul Heras), showed conitibility between the forms and also revealed that was most distant to other forms. Solas soline, the aglycone. moiety of Glycose l kaloids.

-WEED CONTROL

26. FOELDEST (Dezsoe) and JANOSNE (Svab). Chemical weed control with treflan in cultures of solanum laciniatum Art Herba. Hung. 8,3; 1969; 81-92.

Out of a great no. of herbicides tested on cultures of S. Laciniatum treflan, poteran and afalon were found most suitable because they caused little or no damage and accorded satisfactory weed control of the 3 herbicides, Treflum performed best in fields tests when applied to the soil as a spray in an amount of 6 Kg/ha before planting and was plowed under.

-MEDICINAL VALUE

27. KAMYSZEK (Franciszek). Chinchillas ringworm treatment with an aerosol containg glycoalkoids from Solanum laciniatum Ait. Herba Pol. 17,3; 1972; 195-99.

Chinchillas (57) belongs to one of the breeders from poznan served as a material for in vestigations. The effectiveness for selective treatment of the animals with phyton raviforme, confirmed by chimical & laboratory tests was studied.

—NITROGEN NUTRITION

28. KURNOSOV (V V P T) etc. Background of nitrogen nutrition and the irrigation regime of night shade. Agrokimiya. 10; 1971; 20-23.

In the field experiment with S.Laciniatum or night shade growing on irrigated sier ozem the pre sowing application of N (40 KG/ ha) and P (60KG/ Ha) was very effective when combined with a 3- fold N. Supplem- entative period and with sufficient irrigation.

—STUDY OF TISSUE CULTURE

29. SUPNIEWSKA (Jaglwiga Halina) and BARBRA (Dohnal). Tissue culture of solanum laciniatum Ait Analysis of some compounds biosynthesized in vitro. Diss Pharm Pharmacol. 24,2; 1972; 193-203.

Material obtained in tissue culture was analyzed by paper and thin layer chromatography for the presence of free amino acids, organic acid, sugar and steroids The comparision were made with the compoind found in material from soil grown plants. Significant difference were observed in the metabolism of free amino acids and sugars. This result in change of biosynthesis of steriods in vitro cultures.

—STAGGERED SOWING - EFFECTS

30. SZABADY (Judit). Effect of stafgered wowing on the growth and development of solanum Laciniatum Ait. Herb. Hung. 8,3; 1969; 63-75.

With early sowing and trans planting of S. Laciniatum flowering occurs 4 - 6 wk. earlier; lettl sowing in contrest result in a 4 - 9 Wk earlier of flowering. Transplanted plants will grow to a greater hight than untransplanted plants. Sowing during JAN and Feb. gave maximal yield of seed. Later sowing yielded much less seed or none at all; transplanted cultures yielded more seed Potled plants gave the best yield of berries and of seed.

—STEROID AND ALKALOIDS PRODUCTION

31. BARNATH (J) and TETENYI (P). Ecological factors; Adaptability relationship of steriod alkaloids production based on investigation of two species solanum Laciniatum AIT. and solanum dulcamara L. Acta. Bot. Acad. Sci. Hung. 24 1/2, 1978; 41-56.

The formation and accumulation of secondary plant products were studied. Even with a homologous formation of identical secondary mutation and its ecological adaptability must be considered, and the variation must be evaluated in a complex way by simultaneously changes in growth and development. The chages in the total alkaloids production can take place depending on the speices; directly, through the changes in the active agent levels in the organs.

—VIRUS DISEASE

32. GOBARJYANTI (Richard). Tobacco mosaic virus of solanum laciniatum. Herba. Hung. 8,3; 1969; 73-79.

A mechanically communicable virus isolated from leaves of S. Laciniatum naturally infected with the tobacco mosaic virus (TMV), was found to be identical with the TMV, the thermal inactivation point was 90°C, and the dilution limit was between 10-5 and 10-6, Mosaic virus diseane symptoms could be reproduced by rein fection while the control virus strain (TMV U 1) Yielded only a latent infection.

33. THOMPSON (A D). Virus diseases of solanum , aciniatum Ait. in Newzealand. J. Agri. Res. 19,4; 1976; 521-27.

Cucumber mosaic virus, Potato virus Y, Potato virus X, tobacco mosaic and tomato spotted will viruses were indentified in S. laciniatum CMV induced the most severe symptoms involving mottle and narrowing of the leaf lamina. Infection of crops with CMV was 0.70% in cav .85% in 7 crops and PVY 0.48% in 6 crops) PVX was detected in one (77% infection of the 4 crops tested, and TMV in one (17% infection) of the 7 crops tested.

—CHEMICAL WEED CONTROL

34. FOELDEST (D) etc. Localization of the active substance of S. Laciniatum Ait. in indivídual plant organs and its accumulation in the course of the vegetation period. Herba. Hung. 8,3; 1969; 49-61.

The highest contents of active substance was found in the berries and leaves the lowest in the stem marrow and in the leaf skeleton. The growth in height and dry substance formation were essentially completed towards the middle of the vegetative period. Thus under conditions existing in hungry both leaves and berries must be harvested to obtain 80-90% of the active substance produced.

MELONGENA - ANALYSIS

35. PETER (K V) and SINGH (R D). Diallele analysis of economics traits in brinjal. Ind. J. of. Hortic. Sc. 43,5; 1973; 452-55.

Ten characters were studied in a diallel cross of five varieties of S. Melongena. No. of days to following and no. of primary branches were controlled by other dominent gene. fruit weight per plant by dominent gene. hieght by additive gene. fruit lengthh and equtorial perimeter of fruit by additive gene action Additive was observed for no. of fruits per plants and dominant gene. action for weight of fruit per plant.

- ANCESTRAL FORMS

36. KHAN (R). Solanum melongena and its ancestral forms. In HAWKES (J G), Eds. Symposium on biology and Taxonomy of the solanum. (Berminghan) (1979), 7; 629-36.

A few hybridization Exp. have been made made with S. in eanum, S Xantho ear pan, S indicum, S. integrifolivm, S. Hispecon with some success in dicating that S. Melongena has some genthl relationship with all these species. A survey of literature both modern and ancient indicutes that S. melongena originated Asia. probably in In doburma region . But possibly in more than one centre.

- BREEDING

37. CHAKRABARTI(AK) and CHOUDHURY (B). Breeding brinjal resistant to little leaf disease. Proc. I. Nat. Sci. Aca. 41,4; 1975; 379-85.

164 egg plants evs. tested or resistance to little leaf by graft inoculation, 3 showed symptoms late and remained disene free in the field. Solanum integrifolium and S. Gilo showed a by persensitive response to the pathogen. F1 progenies of these two wild spp. with the susceptible ov. pusapurple long behaved like their resistant parents in disease reaction. The wild spp. were rich in phenolic content and the field resistant ov. S. 1212-1was rich in ascorbic acid.

38. KAKIZAKI (Yoiti). Breeding in Japan. J. of heridity 21; 1930; 253-58.

For the practical use of the F_1 cross of egg plants, it should be of suitable shape and quality of fruit for marketing besides being superior in yielding the first flower appears on the 7th to 13th internodes of the main stem. The crossed egg plants one of highly good quality, & also economically important.

-CYTOMORPHOLOGICAL CROSSES

39. GOPIMONY (R)etc. Studies on brinjal hybridization; X feature of F_1 hybrids between cultivated wild brinjal. Agric. Res. J. Kerala. 8,2; 1970; 101-05.

The cytomarphological and chemical aspects of 3 F_1 hybrids of crosses involving 3 cultivars. Brinjal (S. Melongena L.) varieties and 1 wild variety (S. Melongena var. insanum were studied. All three hybrids should a degree of hetrosis in many economically important.

_CHEMOTAXONOMY

40. HIT (Pearce) and RICHARD (Lester N). Chemotaxonomy of the cultivated egg plant: A new look at the taxonomic relationships of solanum melongena. In HAWKES (J G), Eds. symposium on Biology and taksonomy of the solanum. (Birmigham) (1971), 7; 615-26.

Analysis of the seed proteins by electrophoresis and immunology, and of phenolics by chromatography, was used to compare 27 species of solanum. Electrophoresis produced identical patterns of proteins fromseeds of both modern and primitive cultivars of solanum melongena. Similarly pattern for S. in Canum, but less similar for the other species of the section melongena. S. aethiopicum and several others species in sections oligantheae, and also S. anomilum of section Torve formed another distinct group.

_COLOUR INHERITANCE

41. MOLLA (A B). Inheritance of colour in the egg plant (Solanum. Melongena L.) Jour. Dept. Agric. Puerc. R Rico. 16,1; 1932; 19-30.

Plant colour was determined in some of the crosses during early seedling stage. purple plant colour (prpr) is dominant to green; purple red and pink colour of fruit (CC) is dominant to green or white purple corolla (GCI) is dominant to white, and striped anther (Stst) is dominant to non. striping. A series of allelomorphic pairs of factors is assumed.

– DISTRIBUTION

42. MEHR (Eldon). Studies of the distribution and economic importance of Pseudomonas solanacearum E.F.smith in certain crops in philippines. Philipp. Agr. 55,3/4; 1969; 218-23.

Losses averaging 15% , 10% , and 2-5% for tomato, egg plant, peper, and tobacco respectively, were observed in many widely scattered locations. Bacteriae will in nuceptible crop was not observed in Mountain elevation above 5000Ft. and in certain localities near the sea cost.

– EFFECT OF ULTRA ULTRA VOILET IRRADIATION

43. POPOVA (D) and PETROV (K G). Effect of Ultra Voilet Irradiation of parental varieties on the heterotic effect in egg plant (S. Melongena L.) in the F1). Referativnyi. Z. 1; 1973; 55-57.

In studies conducted in 1968-70 rediation of the parents of the hybrid compiration 12 x pliocatesse led to an xxx acceleration of the individual phenophesse in proved vegative dev. and earlier ripening and increased the total yield of the F1.

– FLORAL BIOLOGY

44. PRASAD (D N) and PRAKASH (R). Floral Biology of brinjal. J.Agric Sci. 58; 1988; 1053-61.

The morphology of the flowers, the mane of opening and closing of the flower and antheesis were studied in the varieties large Round white, long purple Bhatta and large round purple. All the varieties had flowers with different style length Fruit setting of long styled flowers varied from 70-86% in different varities, white & short styled flowers did not set fruit. Round white to 55.6% in Bhatta.

45. JAGLIOTTI (L). Floral biology of capsicum and solanum melongena. In 339-412.

In solanum molongena a discussion of flower morphology is followed by a review of flowering physiology and heterostyly; pollination biology is also discussed as well as the physiology control of fruit setting and development. The phenomenon of male sterility is reviewed.

- GENETICS - STUDY

46. CHOUDHURI (H C). Genetical studies in some west African solanum melongena L. Can. J. Genet. Cytol. 14,2; 1972; 446-49.

Heterosis for leaf index was found in the inter varietal hybrid S.melongena L. The indices of hybrid exceeded significantly those of the parents. Inheritance of plant height is controlled by a pair of factors. T being dominant for tall and t recessive for dwarf. The deeply lobed leaf form is controlled by a pair of factors LL which is partially dominant over slightly lobed leaf.

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47. NSOWAH (G F). Genetic variation in local and exotic varieties of garden eggs (egg Plants). Ghana.J.Sci. 9,1; 1969; 61-73.

The genetic variation in morphological and physiological characters (floral initiation and opening maturity and yield during the main (march - July) and the minor rainy season. of 11 Nleval variations of egg plants of solanum intergritolium and 6 exotic(S. melongena). Varieties of egg plants are described. Genetic variation existed in all characters studied.

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48. SILVETTI (S) and BRUNELLI (B). Methodology for the genetic study of varieties of egg plant. Genet. Agr. 22,3; 1971; 277-83.

To reduce the number of observations on egg plant for breeding, different plant traits were studied on six varieties. Earliness is estimated using the mean number of days to the anthesis of the second flower, for estiharvesting must be continued until the mean yield of the variety is reached.

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49. SINHA (B K) etc. Heritability studies in brinjal (Solanum melongena L.) J. Agr. Res. Ranchi. Uni. 1,1; 1966; 15-8.

Genetic co efficient of variation, heritibility estimates and genetic advance were studied in 8 varieties of brinjal in order to evaluate the genetical architecheres of the various characters. In brinjal individual plant selection for fruit no. per plant may be effective the next ranking character may be fruit breedth.

-VARIABILITY - HERITABILITY

50. SINGH (S N)etc. Genetic Verability, heritability and genetic advance in barti (S. Melongena. L.) Prog. Hort. 6,1; 1974; 15-18.

The following character were recorded in 24 lines of S.Melogena. L. no. of days to flowering, height, fruit length and circumtances no. of primary and secondary branche, fruit weight. High estimates of genetic advance were obtained for fruit weight, Fruit length yield per plant and Fruit circumtances.

-HETROSIS

51. PRASAD (D N) and PRAKASH (R). Hetrosis in Brinjal (Solanum Melongena L.) J. Agr. Res, Ranchi. Uni. 1, 1; 1966; 19-21.

Four varieties of brinjal and their F_1 hybrids were studied to show hybrid vigour in 10 quentitator plant characters. F_1 values in 1 cross exceeded the mid parental values for all the characters except fruit wt, whereas in the other cross F_1 values exceeded to mid-parent values for all the character exeple the fruit length. F_1 hybride of all the crossed wer suprior over their better perents for fruit yield.

-HYBRIDISATION

52. RAO (Narasimha N). The barriers of hybridisation between solanum melungena and other species of solanum. In HAWKES (J G), Eds. symposium on Biology and Taxonomy of the solanum (Birmingham)(1979) 7; 605-12.

Complete failure of fruit set, formation of partheno x carpic fruits, production of shrunken seeds or well developed but non germinable seeds and seeding mortality are different phenomena indicative of crossing

failure. partial in compatibility barriers permit crosses of many combination to be made only in one direction.

-HYBRIDISED - MALE STERILITY

53. JYOTISHI (R P) and HUSAIN (S H). Use of 2,4-D as an aid in hybrid seed production in brinjal (S.Melongena) J.N.K.V.V. RPS J. 2,20; 1968; 20-25.

2,4- Dat 10 ppm induced complete male sterility in brinjal with out causing female sterility. This brinjal plant was totaly male sterile one. This sterility is very important for the brinjal plant and this male sterility was female sterile one.

-HYBRID VIGOUR

54. KAMIZAKI (Y). Hybrid vigour in eff plant and its practical utilization Genetics. 16; 1931; 1-25.

1.Comparison between 41 intervarietal crosses of egg plants and their parents (2) In most crosses the F1 seed was heavier as the immediate effect of cross were determined as the most superior ones for practical culture to some extent in Japan. Finally, the technique of crossing egg-plants have been described.

-INDUCTION OF HYPERCHOLESTEROLEMIA

55. MIRCHEK (Godefray HA). On the effects of solanum melongena in experimentel ather ometosis. J Crude Drug. Res. 12 ,4; 1972;

Hypercholesterolemia induced in rabb its can be inhibited by small daily doses of solanum melongena. This action affects not only cholestrol total lipids and phospholipids but also seems to prevent formation of pre pre-B lipoproteins.

- -PARTHENOCARPY

56. PAL (G) and OLAH (J). Parthenocarpy induced in egg plants. Acta Agron Acad Sci. 18,1/2; 1969; 79-85.

As a consequence of a stimulus evoked by pollen on the pistils of the egg plant, parthenocarpic and normal fruit develop from isolated and non isolated emasculated and nonemasculated flowers with or with out fertilization when the pistil is artificially stimulated by towching, only parthenocarpic fruits will develops. If the pistil is not stimulated then neither parthenocarpic non normal fruits develop.

-LEAF ARCHITECHURE

57. INAMDAR (J A) and MURTHY (G S R). Leaf architechur in some solanaceae. Flora (Jena.) 1978; 167(5/4); 265-72.

pinnate camptodromous venation is observed in some spp. of the solanaceae (Capsicum annuum, S.Melongena, S nigrum, S. tuberosum). The solanaceous leaves are univeined. The no. of secondaries and free vein endings vary in each species irrespective of the leaf and areola size. Looped marginal ultimate venation is observed in majority of the species studied where as in others marginal fibriate vein is present.

—LEAVES - FOLIAR SPRAY

58. SHIVASHANKAR (K). Effect of foliar sprays on the leaf anatomy of brinjal. (S. melongena L). Mysore J. agric Sci. 5,3; 1971; 405-7.

$(NH_4)_2 SO_4$ and Urea were applied on brinjal 45 days after planting. The leaf & petiole thickness increased with the increase in the dosage of fertilizer solution 80 lb N/acre urea sprays had the greatest effect. The role may serve as a useful plant part in evaluating the critical levels of major plants nutrients, peticularly of N.

—MEIOSIS AND CHROMOSOME NUMBER

59. KOJIMA(H) ( ). On the meiosis and chromosome number in different races of Capsicum melongena. Bot. Mag. 39; 1925; 119-120.

Studies on the cytology of many varieties of the eggplant and found the basic chromosome no in all the varities being.

—MORPHOHISTOGENIC STUDIES

60. SHAH (JJ) and PATEL (JD). Morphohistogenic studies in vegetative and floral buds of brinjal and chilli. Phytomorphotogy 20,3; 1970; 209-21.

The ontogeney development of the floral and vegetative buds in 2m-embers of solenaceae. Brinjal and Chilli are considered. Brinjal flowers are extra auxillary and vegetative buds are auxillary. Chilli flowers are terminate and 2 auxilary buds below the flower produce a dichasium. The 2nd lateral branches form a dichasium and terminal apex is transformed into floral apex.

—MOSAIC DISEASE

61. RAO (D. Rajyalakshmi). New eggplant mosaic disease.

A mosaic disease of S. melongena serollogically related to bottle gourd mosaic virus is described. In addition to egg plant the disease is transmitted to a number of hosts. The temperatures are 0 - 4 C of the virus are 60 - 65 C, 1:1000 and 48 h and 5 - 6 days respectively. The virus particles are rods 290 nm long and 18 nm wide.

—VIRUS - SEED TRANSMISSION

62. MAYEE (CD) and KHATRI (H.L). Seed transmission of Brinjal mosaic virus in some varieties of brinjal. Phytopathology. 28,2; 1975; 258-60.

Seed transmission of the virus varied greadly amongst 15 eggplant vars. Seed storagedecreased the percentage of the seed transmission gradually, with tatal loss of infectivity after 7 months. The incubation period of the virus was modfied by temp. But var. had little effect the virus was recovered from all parts of the plant except the immature fruit and the pulp of nature fruit.

—MUTAGENS IN BREEDING

63. ANDRIEVSKII (AS). Use of mutagens in breeding egg plants Referativnyi Z hurmal 2,55; 1971; 205-7.

Seeds of seven varieties belonging to subsp. Orientale were treated with N-nitroso- N - ethylurea, ethyle naimine and dimethyl sulphate for 24h. Productivity and early forms, and also plants, combining both characters were obtained in the M1. The most effective mutagen was N - nitroso - N - ethylurea. Characters which arose in the M_1 were in a number of cases retained in the M2 and M_3.

—OCCURENCE OF r- HYDROXY GLUTAMIC ACID

64. RAMASWAMI (S) and RAGE (DV). Occurence of r- hydroxy glutamic acid in Brinjal Curr. Sci. 41,18; 1972; 681-82.

Investigation shows that non enzymic discolorations in S. melongena an Unusual ninhydrin positive spot was detected in the free amino acid pool. This Compound who identified as r- hydroxy glutamic acid on the basis of the following observations. The acidic emoneiod fraction of the filtrate obtained from brinjal shows an unusuel slow moving ninhydrin positive Compound onthe two dimensional Chromatogram.

—PHYTOPHTHORA INFESTANS-EFFECTS

65. HASKELL (RJ). Phytophthora infestan on eggplant in the U.S. Phytopathology 11; 1921; 504-5.

During the summer of 1915 P. infestans was found producing lesion on the peduncles and the Calyces and causing decay of young fruits of the egg plants (S. melongenor L). The egg plants were growing in a field of Irish potatoes. badly infested with this fungus. This fungus is dangerous to egg plants.

— PLANT HARMING EFFECTS

66. BRIGHIGNA (A) and RASTAINO (F). Investigation of the effects of a plant - harmone on egg plant flowers in green house. Genet. Agr. 22,5; 1969; 223-42.

In trails carried out in two seasons. The influence of treatments of the phytoregulating chemical Harmo 7, sprayed on flowers, was studied in 5 cultivars of egg plant (Solanum Melongena L). The two japanease cultivars Hybrid Nagoka long Black and Hybrid Nagoka Sujunari were better producers that the Italian cultivars Lunga Violetta. The values of comercial production and early repening were increased by Harmo 7; the sugar contents in fruits was decreased.

— POPULATION - TRANSPLANTING

67. RAJPUT (CBS) and PANDEY (UB). Effects of plant population and time of transplanting on growth and yield of brinjal Solanum Melongena linns. Proc. Indic. Symp.Horti. 1968.

Interaction of cultivar and time of transplanting produced significant effects on growth and yield, Populations of 18518 and 29629 Plants/ha. did not show any effect.

— POLLINATION METHOD

68. PAL (G) and TALLER (M). Effects of Pollination methods onfertilization egg plant (S. Melongena). Acta Agron Acad Sci Hung 18,3; 1969; 307-15.

Fruit set and primordial seed fertilization in egg plant develop independently of each other after pollination. The no. of seeds in fruits depends on the method of pollination it is highest in free pollination some what lower in selfed plants and lowest depending on variety and year in cross pollination. Egg plants are not obligate but facultative self pollinating plants.

— POLYPLOIDY

69. JANAKI AMMAL (E.K). Polyploidy in Solunum melongena linn. Cytologia 5; 1934; 453-59.

Studied the cytology of S melongeva and reported five types of chromeos with median Centromores.

- RESISTANCE

70. SALBANDAM (CN) etc. Studies on the mechanism of resistance found in egg plant and certad wild solaum. spe. to Epilachna vigintiotopunotata F. Annamalai University Agricultural Research Annual. 6; 1976; 53-70.

The study comprised the highly resistant species S. torrum the moderately resistant S. melongena and the highly susceptible accession 10. The susceptible accession coutained more total nitrogen amino nitrogen amino acid, starch, crude tiber and potassium in the leaves than the moderately resistant.

- TOMYROTHECIUM BLIGHT

71. SINGH (DV). Note on the resistance to Myrothecium blight in brinjal (Solanum melongenal) Indian J. agric Sci 42,5; 1972; 431-32.

Two - no - old seedlings of various lines were used. The collections included a varietyof color shape and size of fruits. The plants also differed in charactors like hieght, spread, pigmentation, size of the leaves. Ten seedlings of each line were inoculated with the spore suspension (Myrothecium roridum) and kept in a moist chamber for 36 hr. Observation were made after 1 week and after 2 weak after inoculations.

- WILT DISEASE

72. LOCKWOOD (JL). Grafting eggplants on resistent rootstocks as a possible approach for control of verticillium wilt Plant Dis Rep 54,10; 1970; 846-48.

Grafting wiltsusceptble commercial egg plant (s. melon - gena) scions onto resistant to meto root high level of resistence to verticillivm wilt in small scall field tests. Termenat grafts gave sturdier plants than those obtained by approach grafting.

- SEED STORAGE

73. MAYEE (CD). Storage of seed for pragmatic control of virus causing mosaic disease of brinjal. Seed science and Technology 5,3; 1977; 555-58.

After seven months storage at room temparature, virus activity in seed ofdevenouiivors of S. melongena was lost with out any appreciable loss in germination pusa Kranti,

Pusa purple Long, R54 still showed virus activity, although their seed macerates produced systemetic chlorotic lesions instead of usual mosaic symptoms.

— TRANSMISSION

74. KODOO (KJ). Seed transmission of Verticillum wilt of egg plants and Limetoes Phytopathology 24; 1934; 1264-68.

The verticillum wilt fungus may be carried by tomato and egg plant seeds. A lot water treat ment at 120 f for 20 min. may satisfactory sterlize infected seeds of egg plants. but this point in not definitely established. Selection of discease free seeds ishighby recomended.

—SEX EXPRESSION

75. LENZ (FRITZ). Effects of fruit on sex expression in egg plant (S. Molougena L.). Hort. Res. 10,1; 1970; 81-82.

Using plants with 0,2 and 4 flowers, as these blossoms set fruit, the new developing flowers had smaller stylls, the larger number of fruits on the plant. As seeds are strong centres of auxin production, the developng. fruits control pistil and stamen length, and thine by control sex expression.

—SHOOT AND FRUITS - CONTROL

76. SRINIVASAN (PM) and GOMEZ (R. BHATTAI). Study of control of the brinjal shoot and fruit borow. Indian J. Agri sci 29,1; 1959; 71-3.

Lencinodes orbonalis G. is a serious pest of brinjal in Madras. It damage the shoots and fruits to a considerable extent. The adult is a grey brown moth with whitish wings and pink markings. The Cartijrillars are short, stout and pink in colour. They bore into the top shoots of young plants and cause withering. Lindane 0.1% is effected in controlling the boren. DDT 0.1% and indave 0.1% have the given the highest yield of borer free fruits.

—SWOING

77. SAIGINAIO (NN). Sowing qualities and productivity of the seeds of sweetnod pepper egg plant as a function of the modurily of the seed plant and the tune of Harvesting Ref. Zh. otd. vyj. Raste. rievod. 8,1; 1969; 185-203.

The sowing ualities of the seeds of the nell pepper cultures Novocher Kesskii 55' and Moldavkii obtained from red fruit (matured on the plant) was bettor than those of seeds teken from fruits the sprouting rath was 6-13% higher and the total yield 18% higher. The 1000 grain nought was higher as the fruits was made mature.

STUDIES FOR SUSCEPTIBILITY

78. DHANKHAR (B S)etc. Screening and variability studies for relative susceptibility to shoot and fruit borer in normal and ratoon crop of brinjal. Haryana Journal of Horticultural Science. 6,1; 1977; 50-58.

The wild species S.Sisymbriifolium in 1972-73 and PPC 2 were the least susceptible in normal and ratoon crops, followed by A vshey, and they may be graded as toterant. Their yields were low, except that Avshey gave a good yield in the normal crop. There was significant phenotypic and genotypic variability for several characters.

ANTHERSGROWING CONDITION

79. ISLAM (A J) etc. Embrological studies of Anthers of solanum melongena. Pak. J.Bot. 2,2; 1971; 47-52.

The anthers of the two varieties of S. Melongena were found to require different media and different supplements for callus formation. The different parts i.e. fouit filament, style and stigma of the same variety could be induced to callus but by different media and supplements. The probable reason for such differential responses to nutrient media are discussed.

GROWING CONDITION

80. GOGHALE (V G). A study of the condition under which water of tidal saline creeks is utilized for crop production. Agric. Jour. India. 14; 1919; 422-30.

S.melongena and C. frutescens were found to grow under very alkalility condition. This condition is very good for its growth.

MULCHES

81. GERAKIS (P A) and TSANGARAKIS (C Z). Underground mulches in central suden. East. Afr. Agr. Forest. J. 35,3; 1970; 254-56.

Plastic Polythene sheets with 0.5 cm diameter perforations spaced 3 x 3 cm, placed at 5 cm depth conserved wough soil moisture to enable growth and fruiting of egg plant (solanum Melongena L) on only 451 mm rainfall.

-STUDIES ON CORBON DIOXIDE ENVIRONMENT

82. IMAZU (I K)etc. Studies on the CO_2 environment for plant growth ; effects of CO_2 Conc. on the growth of flowering and fruit settin of egg plant (Solanum melongina L) J. Jap. Soc. Hort. Sci. 36,3; 1967; 275-80.

The cultivars of sanryo was grown in polyvinyl plastic growth consbers treated with CO_2 at 4 levels of conc, 200, 300 (normal air) 980 and 31000 ppm for 8 hour daily for 3mo. Differences in growth and appearence of the plants grown under the normal and the above normal levels of co2 were apparent with in 20 days. Marked increases in the treash and dry wt no. of leaves and leaf area were observed as CO_2 conc. increased.

-UNFERTILIZED OVULES CULTURE

83. UCHIMIYA (H)etc. Invitro culture of unfertilized ovules in S. melongena and its effects Jap. J. Breed. 21, 5; 1971; 247-50.

Division of haploid cells in cultvring unfertilized ovaries in S. melongena was observed. In the ovary culture of Z. mays. adventitions roots differentiated from callustissues. It seems possible to induce haploid plants from female gametophyte in angiosperm by the artificial culture. Haploid plants were the result of this culture.

-VIGOUR OF F1 PLANTS

84. KATODA (T). Vigour of F1 plants as related to age of seed seeds in egg plants. Hort. Assoc. Japan. J. 8; 1937; 351-55.

In egg plants vigour of F_1 plants is related to age of the seeds and F_1 crosses of should be of suitable shape and quality of fruit for marketing beside being superior in yeilding. In most crosses the F_1 seeds was heavier as the immediate effect of crosses.

-VIRUS DISEASES

85. HINDRA (O S) and SOHI (A S). Host range of Hishimonus phycitis (Distent) Homiptera Jassidal, the vector of little leaf virus of brinjal. J. Res. Punjab Agr. Uni. 5,2; 1968; 232-36.

Tests with 47 plants species belonging to 14 families revealed that besides brinjal, H. phycitis (Distant) the Jassidal vector of brinjal little leaf virus, can breed success fully on as terbitter gourd, Tinha (cucerbita fistolosus) water melon. etc. Especially tobacco on which they died with in 8 hr and tomato on which mortality occured with in 24 hr.

-YIELD HARMONES

86.RESTAINO (F). Yield and response to plant harmones in some varieties of egg plant (S. melongena L). Sementieletta. 17; 1971; 47-55.

The effect of the commercial preparation Harmo 7 on yield and earliners of seven varieties were observed. Precocissima hybrid became the earliest after treatment through Lunga Violetta showed the greatest improvement in earliners. While some early yields showed improvements of over 100% following treatment.

- -WATER AVAILABILITY

87.VERI (Giuliana). Effect of differentiation in the availability of water on the yield of egg plant. Ric. Sci. 38,5; 1968; 487-92.

Variation of soil moistore availability of 50% and 100% was obtained by adjusting the weekly quantities of water supply. This action produced a better yield of egg plant per unit area from the out set, the Ist crop showed a higher weight of yield with 100% availability. The levelss of available soil moisture must be sufficiently high in relation to a given soil moisture atom. system.

-ZINC AND BORON - EFFECTS

88.JYOTISHI (R P) and KASHYAP (R). Effects of some trace elements as foliar spray under varying levels of N2 and P. on the protein cartent of brinjal fruits. Ind. J. Sci. 2,1; 1968; 27-32.

Foliar spray of Zn. and B. increased protein content In general 134.02 N_2 + 22.34 P_2O_5 with Zn. spray and 89.35 N_2 + 44.67 P_2O_5 with B spray resulted in equal and maximum protein contents.

NIGRUM - ANTHER CULTURE

89.HARN (Chang Y). Studies on the anther culture of solanum nigrum L. II-Korean J. Bot. 14,2; 1971; 45-46.

The calluses embedded on the differentiation medium quickly became dark brown. Plant lets developed latter from these blackened callus masses in callus sectioned 10 Wk. after imbedding on the differentiation medium radially closyeated tissue, concentric tissue , epedermis, tracheid like structure, and plant primordia were observed.

-BIOSYSTAMATIC AND TAXONOMIC STUDIES

90. CHARLES (B). Biosystematic and toxometric studies of the solanum nigrum complex in eastern North America. In 557-66.

The difficulties of the taxonomic recognition and treatment of the members of the S.nigrum Complex one well exemplified by a study of the group in eastern North America a region well known botanically, Must previous authors have recognized one or two species (excluding the casually adventive species) in this area. on the basis of morphological studies using taxometric analysis, and artificial hybridization, there are three distinguish elements (1) S. Pseudogracile (2) W. Nodiflorm (3) S. Americanum.

-BREEDING SYSTEM

91. VENKATESWARLU (J) and KRISHNARAO (M). Breeding system cross ability relation ships and isolating mechanisims in the Solanum nigrum complex. Cytologia 37,2; 1972; 317-26.

Breeding system mechanisum were studied in the S.nigrum L. Complex, using 16 acc-essions induding 7 diploids, 5 tetraploids and 4 hexaploids. It was found that the diploids could be crossed with each other and also with natural letraploids very easily but never with hexploid crosses between 2 tetraploids or 2 hexaploids readily produce hybrids. The diploid & tetraploid race of S. nigrum are isolated by hybrid sterility.

-COROLLA TUBE FORMATION

92. NISHINO (EISHO). Corola tube formation in S. nigrum. investigated anatomically. Bot. mag tokyo 91,1024; 1978; 265-78.

In solanum, the formation of the lower portion of the corolla tube, including the portion below the stamen insertion and the inserted zone begins with the extension of the bases of the petal primordia toward the inter primordial regions. The extension of the petal bases is caused by the successive incorporation of the inter primordial regions just beside the bases into the petal primordia by means of the upward growth at those regions.

- DEHISCENCE OF ANTHERS

93. NAMAKATA (I). Dehiscence of the anthers of some solanaceae Bot. Mag. Tokyo. 53, 1919; 62-69.

The dehiscence mechanisms are described in some solanaceae detail for the following Solanum negrum. The epidermi epidermis of the suture is undertain by a special disjireture tissue from 1-7 layers. thick. The first change in these cells are accompanied by an accumulation of oxetic acid and calcium oxalate. The acid and calcium oxalate. The acid then attacks the protoplasm and destroys it. It converts the walls into hemicellulose and finally dissolves them entirely. These changes occur before the flower opens.

— DISTRIBUTION - AUSTRALIA

94. HENDERSON (R J F). Solanum nigrum and related species in Australia. Queen's land Herbarium. 16, 1974; 80p.

A key for the identification of eleven species of solanum is presented somatic chromosome numbers of 24, 48, 72 were noted in the plants of solanum. Solanum studied S. Nudiflorum. Nudiflorum crossed readily with sub sp. nutans but crosses between S. nudiflorum sup sp. nutans and S. Opacum were not successful.

— PENICILLIN - SENESCENCE RETARDATION

95. SHARMA (Keshav D) and SEN (David N). Retardation of senescence by penicillin and increase of sugars and dry matter product in S. nigrum L. Z. Pflanzenphysiol. 65,5; 1971; 468-70.

The effect of penicillin on productivity of dry matter and reducing sugars was studied in leaf discs of S. Nigrum L. Penicillin solutins of 10 ppm beneficialy affected plant metabolism delayed senescence and controlled break down to a certain extent in this species.

— PROTOPLAST

96. RAJ (Baldeew) and HERR (J M). Isolation of protoplast from the cells in tissue slices treated solanum nigrum L. Nigrum L. Proto Plasma. 69,3; 1970; 291-300.

Living proto plasts were isolated from the in ter placental regions of S. nigrum berries by the removal of 1-2 hr with 1% pectinase in 0.35 - 0.38 M sucrose. solution. Further studies on some aspects of specific medium requirements are in progress.

97 PHUREJA - MEOSIS

97. HOGLUND (Monica). Meosis in Solanum Phureja. Hereditas. 66,2; 1970; 183-88.

Meiosis and pollen mitosis were studied in a clone of S. phureja in order to eluerdate the generally high feequency (about 90%) of teirapioid pregency in teliapl&bd X diplind cross inwlving S. phureja. Hence the high frequency of tetra plord of afespring in S tuberosum X S. phureja crosses could be eemsed by selective fertilization with unreduced diploid pollen grems.

-RESISTANCE TO SOLOMON AS

98. ROWE (P R). Additional genes for resistance to pseudomones solenaceerum in solenum phureja. phytopathology 62,9; 1972; 1093-94.

Certain clones of S. phureja have high levels of the resistance to P. Solanacearum in growth chamber test 10 hybrid families were tested under growth chamber conditions by in oculation with a race 1 isolated of P. Solanacearum one of these genes is required to give resistance to another race 1 isolate K-60 Resistance appreently is controlled by reletively gew gene in a system that is partially interrelated yet specific for certain strains of the beoterium.

- -PSEUDOMON AS SOLANACEARUM

99. ROWE (P R) and LUIS (Sequera). In heritence of reestence to peyendomones solenaceerum in solenum phureja. phytopathology. 60,10; 1970; 1499-1501.

Eleven hybrids families (50 - 100 paint each) involving of perents were tested under growth chamber conditions by in culation with a race 1 isolate of p. solanum from tomato (K-60). Each plent wes inoculated by stem puncture at the prebud stege and held for 15 days at 28°C , 90. 5% retative humidity and 21000 ft-C on a 14 hr photoperiod.

POLYTRICHON-LATE BLIGHT - GENOME RELATIONSHIP

100. HAWKES (M S). Fertility, late blight resistence and genome relationship in an interspecific hybrid, S. polytrichon. Euphytica. 19,3; 1970; 317-26.

S. polytrichon (2N = 48) in easily crossed with S. phureja (2N = 24) In the F1 progeny only triploids are found. The triploid hybrids are highly variable and pollen sterile. Sterility and reduced vigor of some F_1 plants are believed to be due to disharmony of the parental genomes or due to gene - cytoplasm interaction.

POTATO - AMINOACID COMPOSITION

101. KALDY (M C). Amino acid composition of selected potato varieties. J. Food Sci. 37,3; 1972; 375-77

The quality of proteins in 1 cultivar and 5 clonal selections of the potato was evaluated by amino acid analysis 17 amino acids were determined by means of a Beckman model 120 C amino acid analyzer. Methionine and Cystine were oxidized with performic acid to methionine sulfone and cysteic acid.

—BIOCHEMICAL METHOD - HIGH SPECIFIC ACTIVITY

102. GALLIARD (T). Simple biochemical method for the preparation of high specific activity. Biochem. Biophys. Acta. 260,4; 1972; 541-46.

14C acetate into the Phospholipids of thin slices of Potato (S. tuberosom) tubers. From 29 g of tissue and 100 u ci/of strate, Phosphat dylcholine contained to 15-60% of the administered radio activity and had a specific radio activity of approxomity. The Phosphat dylcholine was lebelled mainly (63%) in the unpaturated tally acids and was thus suitable for use a traeer and sustrate in biochemical studies.

—BREEDING

103. SEMENOVA (I A). Result of using solanum stenotomom, S. Longipedicellatum and S. dolichostigma in breeding potato for high content of dry matter Referativnyi Zhurnal 12,55; 1976; 47-55.

Judging by the extent to which it transmitted these characters to the progeny, the best spe for breeding for protein and starch content and yield was S. Stenotomum. S. Longipedicellatum was promising for breeding for starch content.

—CHARACTER ASSOCIATION

104. GAUR (P C) etc. Studies on Character association in potatoes J. of agricultural science. Uk. 90,1; 1978; 215-19.

Phenotypic and genotypic environmental correlation co efficients are tabulated for 13 morphological and tuber quality characters of 67 S. tuberosum varieties and hybrids. Tuber yield was positively associated with average tuber weight and total tuberdry matter per plant. Average tuber weight was negatively associated with tuber number / plant and most of the quality characters.

-CHLORIDE EXCHANGE

105. LANNOYE (R J). Chloride exchange and compartmentation in the fleshy tissues of solanum tuberosum. Annphysiol Veg. Univ Bruxelles. 15,1; 1970; 1-30.

At 0 C the ct absorption isotherm in Kcl for potato slices aged 24 hr. is an exponential function of the external conc. An analysis of Kinetics of ct exchange in potato slices shows that I Components are subcellular in origin. As incharacean cells, they have been equated with the cytoplasm and the Vacuole.

-CHLOROPHYLL AND SOLANINE CONTROL

106. WU (M T) and SALUNKHE (D K). Control of chlorophyll and solanine formation in Potato tubers by oil and diluted oil treatments. Hort science. 7,5; 1972; 466-67.

A treatment of potato tubers at 22 C with corn oil peanut oil olive oil vegetable oil or mineral oil significantly and effectively inhibited Chlorophyll and Solanine formation. A concentration of 1/8 corn oil and 7/8 acetone was the minimim effective diluted oil treatment.

-CROSS

107. KRYUCHKOVA L AF. WAYS of effective increasing of crossing potato varieties withdiploid species. Referativnyi. 2; 1973; 234-41.

The use of pollen mixture in crossing cultivated varieties with diploid spp. improved bery set but not no. of seeds per berry. Spraying the stigmas with boricacid solution increased the no. seeds per berry. formation was rather better than in field cond. in 1964-68, crosses were effected between tecultivated and six diploid species.

-ABILITY BEHAVIOR.

108. RUBENCOSA (CHAVEZ) and MARGARITA (HERNANDEZ DE SOSA). Use of dihaploids in the breeding of S. tuberosum crossability behaviour. Heredities 70,1; 1972; 135-52.

In this study a higher seeds fruits ratio was found in crosses where dihaploids from different taxonomic groups were involved. This ratio amounted to 1.9 in inter dihaploids crosses with in group. Tuberosum, 17.0 in Tuberosum dihaploids X Phureja and 41.0 in Tuberosum dihaploids X Andigena dihaploids. The complete sterility found in crosses between colchicine doubled dihaploids. In potato dihaploids the expression of the gametophytic incompatibility system so well proved in some diploid species of solanum.

-CROSSES AND BREEDING

109. TIMOSHENKO (I I). AND VESELOVSK I I (V M). Inheritance of economic and biological characters of the potato in inter varietal crosses and its importance in breeding new varieties. Referativnyl Zhurnal 34; 1972; 48-55.

Crosses involving the following four wart- resistant varieties were made. The inheritance of economical characters depended on the particular parental components. A greater number of phytopthora resistant hybrids were noted in the combination. Hybrids with high yields and high starch content were noted crosses invoving Trividovoi gibrid 390 L' VOVSKIL belyi and Oliev.

-CROSSING

110. DOBIAS (K). The relationship between resistance to black leg and tuber wet rot in progenies from crosses of potato varieties which differ in resistance. Plant Breeding 48,3; 1978; 215.

Although some authorities maintain that both disorder are caused Erwinia Carotovora, tests involving 15 varieties showed that a particular variety may show differences in resistance to the two diseases such difference in resistance. were heritable but it was possible to predict when crossing Varieties.

-CYTOGENETICS EVOLUTION

111. BUKASOV (S M). Cytogenetics problems of Potato sps evolution are Potato species (s.l.) of section tuberarium (BUK. BUK). Genetika 6,4; 1970; 84-95.

Cytogenetics problems of Potato sps evolution are treated according to the new systematic principle of subdivision of the section. Tuberarium (Pun. Buk) (nom. Bill.) into 5 subsection. The main genecentre of the S. Americum sussection is localeel in the high land zone in. Bolivia and peru. Andina with the series of Andegina and subs onlia and sub-section persifieer with the series Tuberosa is presented.

-CYTOPLASMIC FACTORS

112. GRUN (PAUL) etc. Evolution of cytoplasmic factor in tetraploid cultivated potatoes (solanaceaese). Am.J. Bot. 64,4; 1977; 412-20.

Analyses were made by study of reciproucl crosses of cytplasmic factors of solanum tuberosum SSp. andigena and S. tuberosum ssp. Cytoplasmic factors of these 5 sorts of S. Tuberosme were Compered with those of their diploid ancestors. The lef form and cytoplasmic factors of chili- s 1st generation derivative of Rough Peoplo chili were those of S. Tuberosom SSP tuberosum. Rough purple chili was an example of direct importation from chili.

-DESATURATION IN VITRO

113. BEN ABDELKADER (AHMAD). Desaturation in vitro of oleoyl Coenzyme. A by microsomes isolated from section o of potato tuber CR Hebd Seances Acad Sci Ser D Sci 275,1; 1972; 51-54.

Section of tubers were incubated with Ammonium oleate 1 - 14C and then microsomils were isollated Marked Oleic acid was found in the microsomes from fresh slices incubated with radioactive ammonium Oleate but it the section were maintained in vitro for 10hr. There was Conversion of Olic to l inoleic acid.

-DISEASE

114. CIPAR (M S)etc. Soilfumigation and zinc status of soils in relationship to potato speckle bottom disease development and control. Potato Research. 17,3; 1974; 307-19.

The yield of 5 cultivars representing a range of susceptibilities and a range of maturities and was compared with and with out treatments with the soil fumigent D - D (dichloropropane-dichloropropene) results indicated that soil fungation with D - D and zinc deficiencey were involved in the correction and induction respectively, of speckledbottom symptoms.

— DISTRIBUTION OF 14C

116. SANDERS (D C). Influence of a short perhodof evaporative coding on the distribution of 14C in potato plant Hortscience 7,4; 1972; 420-21.

Potato plants (S. tuberosum) which were intermittently misted fixedmore 14 CO_2 than nonmisted plants. Most of the 14C was foundin the sugar fraction with the greates activity transtocating to the tip of the plant. The highest 14C in the nonvolatile organic acid fraction was found in the leaf which was fed 14 CO_2

— EFFECTS OF BACTERIA

116. PEROMBELON (M C M). Reliable and rapid method for detecting Contamination of potato lubers by Er winia Carotovora Plant Dis ReP 56,6; 1972; 552-54.

(S. tuberosom) are rotted rapdly by e bectera when incubated anaerobically at room temp (17 C) and a retative humidity of 100%. These Conditions favours the growrh of Erwinia Caroto Vora which if present can readily be detected by plating rotting tissue on a sum selective medium with an overlayer of pectate gelm which it forms diagnostic cavities.

— —BORON

117. LEITE (NORBERTO)etc. Effect of addition of boron on potato plant production. Bragantia 29,1; 1972; 329-36

The effects of addition of Bat different rates appled in mixture with common NPK formulation inthe furrow of planting time, aeside dressing or by spraying was studied in an area where deficiency symptoms were observed in the previous year. An increase in potato production of about 20% was obtained with the addition of 10or 20Kg. of boron/ha. mixtures with NPK.

-GAMMARY

118. HORITSU (Keisuke). 60Co gamma ray irradiated with starch of potato. Bull Fac. Agr. Hirosaki Univ. 14; 1968; 7-8.

The potato starch was irradiated with 60 Cogamma ray at 200 Krad. (Dose rate 100 Krad/hr) and 1500 Krad (Krad (Dose rate 1000 K rad/hr) 60 Co gamma ray irradiation may change the Structure of the starch of S. tuberosum. Dose rate may be on important factor in this change. The change structure is very much different from the previous one.

- -HYDROGEN ON CONCENTRATION

119. ALLEN (Edward H) and FELDMESSER (Julius). Nematicidal activity of X - chaconine, Effect of hydrogenion conc. J. Nematol. 3,1; 1971; 58-61.

X - chaconine a steroid glyco alkaloid from S. tuberosum was increasingly more toxic to a free living nematode, panagrellus redivivus with decreasing acidity from ab out pH 5 to 7. A study of the toxicity to adult nematodes at 3 conc. of X chaconine in buffer from pH 4 to 7.5. indicated that free base in the nematodes form of the compound.

-EFFECTS OF ISOPROPANOL

120. JUDEWICZ (N D) etc. Effect of isopropanol on the activity of particulate starch synthetase. Phyto. Chem. Istry. 11, 7; 1972; 2213-2215.

The effect of several alchohols on particulate. Starch synthetases from potato tuber and sweet corn (Zea mays) endosperm was studied. High Conc. of isopropanol in the incubation mixture produced a great increase in the enzyme activity. The action of this alchohol on kinetic constants and on the distribution of incorporated glucose between anylose & amylopectin was studied.

- -LIGHT

121. HANSMITH (William F). Effect of light upon development in potato tissues slices. Plant. Physiol. 49,5; 1972; 857-59.

potato tuber and in most cases from the same tuber itself. All tissues were subjected to identical temperatures, culture times, culture solutions and eration procedures. The absence of presence of light, however, greatly in fluenced the dev. of respiratary characteristics typical of aged storage tissue shoes.

- NITROGEN - POTASSIUM ON PRODUCTION

122. CHAMBERLAND (E) and CAMPAGNA (E). Effect of various doses of N, P and K on the production and the quality of S. tuberosum. Can J. Soil Sci. 49,2; 1969; 247-56.

Yields and quality of tubers were recorded and levels of available P and K in the treated plots were compared with those in the control plots. The amount of N needed at the begining was over 100 Kg / ha the optimum level appeared to be about 90 Kg / ha for subsequent applications P. seemed to be the critical element. Application of 148 Kg / ha of Potassium was followed by an increase of 58 Kg / ha in the level of available K.

- PHOSPHONIC ACID

123. LANGILLE (Alan R). Effectof Phosphonic acid on rhizome and tuber formation in the potato S. tuberosum L. J. Am Soc Hortic. Sci. 93,3; 1972; 305-8.

Although ethephon did not influence number of primary rhizomes on potato katahdin in growth chambers the 500 and 1000 ppm treat ments significantly increased the number of secondly rhizomes Length of primary rhizomes wes increased by 59 ppm treatment. No. of primary tubers / plant decreased with increasing etheplon conc. Total tuber weight / plant wae significantly reduced by all ethophon treatments.

- RADIOSENSITIVITY

124. OLIMPIENDO (G S)etc. Radiosensitivity of seeds some natural and experimental potato autopoly ploids. Tistol Genet. 6,3; 1972; 57-65.

Radioresistance was investigated in seeds of some wild species and experimentally obtained poly ploids of potato differing in resistance to low temperature. When comparing the natural tetraploid and experimental octoploid of the species solanum Schreiteri Buk and S. punae Juz. The authopoly ploids of S. Schreiteri proved to be the most radio resistant

-SOIL MOISTURE AND NITROGEN

125. NARANG (R S) and KANWAL (S S). Effects of variation soil moisture regimes and different levels of Nitrogen and different spacings of the quality of Potato tubers (Solanum Tuberosum L.). J. Res. P. Agri - Univ. 8,4; 1971; 432-36.

The protein content in the tubers increased with each of the levels of available soil moisture up to 20%. As N or N (up to 180 Kg N / ha) where asthe starch content showed a reverse trend altogether. The variation in spacing from 40 cm x 20 x 60 cm x 80 cm did not show any significant in fluence on either of these 2 quality characteristics. This was because of the over rall increased yield of tubers under these treatment.

-WATER DEFICITS

126. FLOWERS (T J). Effect of water deficits on slices of beet root and potato tissue. J. exp Bot. 21, 68; 1970; 768-75.

Effect of water deficits on respiratory metabolism is presented. Oxygen uptake by aged potato tuber discs became increasingly resistant to the effect of 0.05 M malonate with increasing water deficit whilethere was an increasing retardation of oxygen up take by dinitrophenol at 10-4M.

-ELECYROPHORESIS OF PROTIENS

127. RUBICZ (A E) and LORAWIECKA (B). Acrylamide Gel electrophoresis of protions acid phosphateses and R N - ases from three potato cultivars. Acta soc Bot Pol. 41;1; 1972; 107-12.

Protien and acid phosphatase pattern and ribonuclease activity distribution were studied by disc electrophoresis on saline extracts of 3 cultivars of the potato S. Tuberosum L. The protein bands varied in numbers position. One mainzone of the acid phosphatase activity was detected in 4 main zone consisting of 2 - 5 electro phoretically different bands.

-ENZYME ACTIVITY - ELONGATION AND

TUBERIZATION OF STOLONS

128. PALMER (C J) and BARKER (J G). Changes in enzyme activity during elongation and tuberization of stolons of S. Tuberosum L. cultured in Vitro Plant cell physoll. 15,4; 1972; 681-88.

Isolated stolons of S. tuberosum were cultured in Vitro in the presence of Kinetin which induced their initiations. Progressive changes in enzyme activty at the locus of tuber initiation were monitored at specified intervals. In the presence of Kinetin soluble invertase activity was decreased with time where as G A evoked substantial increases in activity. These results are discussed with reference to the role of these enzymes in carbolihydrate metabolism and the regulation of hormone levels.

-ERADICATION OF VIRUS

129. STACE (Smith) etc. Eradication of Potato Spindle Tuber Virus thermotherapy and autiliary bud culture. Phyto Pathology. 60,12; 1970; 1857-58.

P S T V was eradicated from in fected Potato (S. thberosum) by nutrient culture of auxiliary buds excised from heat - treated Plants. Plants infected with severe P S T V were subjected to air temperatures which alternated daily from 330 - 36 C. The low incidence of virus - free Mantlets may be associated with the fact that P S T V appears to be free nucleic acid with no protein coat.

-EVOLUTION

130. GRUN (Paul). Evolution of the Cultivated Potato; A cytoplasmic analysis. In HAWKES (J G), EDS. Symposion on Biology and Taxonomy of the Solanum (Birininghem) (1979), 70; 655-64.

Historical evidence is presented that sub species tuberosum was imported from chile to the Northern Hemisphere after the late blight epiphytoties of the 1840s and it became founder material for our present day cultivated Potato.

-CYTOPLASMIC FACTORS

131. GRUN (Paul). Changes of Cytoplasmic factors during the evolution of the cultivated potato. Evolution 24,1; 1970; 138-98.

The degree of similarity of cytoplasmically inherited factors of the cultivated potato (S. tuberosum) Group. Tuberosum Dodds and its putative diploids progenitors was studied. Reciprocal crosses were performed between diploid lines of group Tubero sum derivedfrom normal tetraploids and tester stocks known to contain Certain cytoplasm sensitive gene.

-F_1 HYBRIDS

132. AVDEEV (Y I). Inheritance of some properties and characteristics in F_1 hybrids from crossing S. tuberosum with S. gibberulosum. Teitol Genet. 5,5; 1971; 403-9.

From crossing of S. tuberosum with a tetraploid form of S. gibberulosum were studied inter specific hybrid of Ist Generation are characterized by the wild type character such as long stolon and non uniform tubers. Out of 4000 seed lings of inter specific hybrids only 5 forms were isolated having short stolon and big uniform tubers.

-FATMETABOLISM

133. HAUNG (K P) and STUMPF (P K). Fat metabolism in higher Plants. XLI. Properties of Potato acety l coenzyme A synthesis. Archs. Biochem. Bio Phys. 140,1; 1970; 158-75.

Potato (S. tuberosum) acety l coenzyme A synthesis was isolated and partially Purified. This enzyme Existed in multiply forms. Five acety l coenzyme A synthesis activty peaks were obtained from D E A E - Cellulose columate graphy. The major form of the Potato acety l CoA synthesis followed ise Bi uniuni Bi Ping Pong mechanism based on initial velocity and product inhibition studies. This mechanism is similar to that of the yeast enzyme.

-FREEZING INJURY

134. KUMMAR (N P) and KISER (C J). Freezing injury in Potato leaves. Plant physiol. 50,5; 1972; 564-67.

Time temperature profiles of freezing leaves from frost resistant (Solenum commerse Bitt) and frost susceptible (S. tuberosum) types of potatos did not seveal any major differences. The pattan of change in resistance of leaves to low volt age, low frequency current during freezing was different in the frost resistant and susceptible leaves. Cells from resistant leaves showed a higher osmotic pressure but not a higher water permeability

- FROST HARDINESS

135. MANNER (Rolf) and SUOMINEN (Reeta). Frost hardiness of potatoes. Ann Agr. Fenn 8,3; 1970; 228-38.

The species, varieties and hybrids in the experiment grew taller in long day condition than in short day conditions. The average number of leaves was smaller when the day was shorter. The long day improved frost hardiness of the leaves. There were considerable differences in the frost hardinesses of the species, verities and hybrids of potato in the experiments.

- GAMMARAY IRRADIATION

136. HORITSU (Keisuke). 60 Cogamma-ray irrdiation on starch. Bull. Fac. Agr. Hiroshi. Uni. 14; 1968; 7-8.

The potato starch was irradiated with 60 cogamma ray at 200 K rad (Dose rate 100 Krad thr) and 1500 Krad (Dose rate 1000 Krad thr.) 60 cogamma ray. Irriadeation may change the structure of starch. Dose rate may be an important factor in this change.

- GENETICS

137. HOWARD (H W). Genetics of the Ptato Solanum tuberosum. Phyto Pathology. 44,2; 1989; 126-31.

The cytology is described including miosis triploidy dihaploidy, Peety tene analysis, the origin of S. tuberosum and genetical consequences of autoletra Ploidy. The ferlitity and sterility problems are covered in discussion of flower induction, flower retention and berry formation, stroage of Pollen, S. alleles and ovule fertility and stirility. Indexes are added of gene symbols and solanum species and varieties.

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138. HOUNT (Donald). The potato Science. 170,3963; 1970; 1161-66.

Evolution of tetraploids from the S. stenotomum and S. sparsipilum) is discussed. Other possible modes of origin are also considerd. Gene exchange with the hardly S. acaule are also suggested. It appears that a no. of species have contributed to the genetic make up of cultivated potato. The man weedy potato types near and inprimilive fields probably maintained a wide genetic base.

-GROWTH - CALCIUM - DEFICIECY

139. SINGH (O S) and SHARMA (Vijay K). Alterations in growth and metabolism of potato plants by Calcium deficiency. Plant soil 36,2; 1972; 363-69.

Experiment in water culture was conducted to evaluate the Ca deficiency symptoms and their Cause in Solanum tuberosum L. Meristematic regions at stelm and roots were severely affected and ultimately ceased to grwo. Plants remained stunted with few and smaller tubers. Reducing sugar, neon reducing sugar and starch accumulated more in the leaves and stems and less in roots and tubers of Ca deficient plants.

-HAIRY SPROUT

140. KALEY (D N) and NAGAICH (D B). Hairy sprout of potato (S. tuberosum L) Indian J. Agric. Sci. 41,11; 1972; 1006-8.

Plant emergense, stem elongation, number of shoots no. of leaves and tuber yeild were studied. The plants grown from the hairy sprout tubers emerged slowly. The plants were stunted and had short inter nodes. Some stems were stringly with small and simple leaves. The hieght and number of leaves plant tuber yeild were significantly reduced in the plants emerging from hairy. sprout tubers. Reduction in tuber yeild varied from 41.7 to 94 % .

- HYBRIDIZATION

141. HADDDI (A). Hybridization of potato spindle tuber to cellular DNA of normal Plants. Proce. N. Acad of sci. USA. 73,7; 1976; 2453-57.

The viriod (PSTV) hybridized invitro with cellular DNA from several uninfected host spp. in solunaceae and infection had no detectable effection solanaceaious Plants. PSTV sequences did not induces in Lycopersicon or Gynura at detectable levels. The results are considered to support thy Phpthosis that PSTV may have originated frongenes in normal solanaceaous plants.

-HYDROLASE ACTIVITY

142. PITT (D). Changes in hydrolase activity of solanum tuber tissues during infection by phytophthora eryth roseptica. Trans Brit Mycol Soc. 55,2; 1970; 259-66.

Enzyme extracts from healthy potato tuber tissues and tissue culture cells showed varying phosphohydrolytic activity towards a range of phosphate estates. Infection resulted in increased acid phosphatase activity towards some substrates and decreased activity towards others.

—INDUCTION OF COUMARIN

145. STALLKNECHT (G F). Coumarin - induced tuber formation on ixcised shoots of S. tuberusum L. Cultured in vitro. Plant Physiol. 50,3; 1972; 412-13.

Coumarin was shown to be a potent stimulator of tuber initiation on shoots of the S. tuberosum concentration of 25-50 mg / l were optimum for tuberization, which began 10-14 days after addition of the coumarin to the medium. This result was very imprtant and in growth of the S. tuberosum.

—INTERRELATIONSHIP OF ALUMINIUM AND MANGANESE

144. LEE (C R). Interrelationships of aluminium and manganese on the potato Plant. Agron.J. 64,4; 1972; 546-49.

Effects of Al and Mn levels in growth medium were observed in the color or plants tops. Visual symptoms of Mn-induced Fe deficiency in nutrient solution cultures were associated with Mn / Fe conc Plant Fecontent and de creasing Mn / Fe ratios to less than 18. Absoption and translocation of P, Ca and Mg were affected by the addition of either Al or Mn to the nutrient solution cultures.

—IRRADIATION OF GAMA RAYS

145. KAIMAN (A) and YANVLENUL (G). Dihaploid from of solanum tuberosum obtained from Gamma - irradiated seeds. Izv Akad. Nauk. Mest. SSR. 16,4; 1967; 559-62.

The hybrid seeds of potato (S. tubero sum L) were treated with Gamma radiation 60 co. After the irradiation 1 dihaploid Plant was. discovered among the experimental material. The morphological peculerities of the dihaploid plant are described. It may be used for crossing with primitive potato sp seas 15 obtain new initial material for breeding.

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146. MELENTSEV (A V). Effects of gamma-irradiation on the frequency of chromosomes aberrations in Potato seeds (S. tuberosum. L.) Genetika. 6,11; 1970; 52-56.

potato seeds were irradicted by Co ^{60} in doses some ablerrations inthe anephase of the I&II mitosis were regectered. The no. of aberrations dependence inareased with the increase of irradiation dose and dependent on the genotype of the experimental material. Hybrids are more resistant to irradiation as composed with the self - Pollinated seeds.

- LIPOLYTIC ACYL HYDROLASE

147. GALLIARD (T) and DENNIS (D). Isoenzymes of lipolytic acyl hydrolase and esterase in potato tuber. Phyto-Chem. 1974; 13,11; 2465-68.

five varieties were shown by gel and free flow electro phoresis to exhibit multiple forms of lipolytic acyl hydrolase (A H) activity. Golden wonder having the highest and one disire, a relative low level of activity. The esterase activity of desiree was about half that of the high (L A H) varieties where as the LAH activity of Desires was only about 0.5% that of the high acitivityof varieties.

- MORPHOLOGICAL

148. COUTS (R H A). Observations on the isolation, morphology and culture of potato leaf and meristem protoplasts. In HAWKES (J G), Eds. Symposium on Biology and taxonomy of the Solanum (Birmingham) (1978), 7; 571-75.

Protoplasts from the species of solanum tuberosum L.Cv. King Edward after their Excision from sprouting tubers, and also from fully Expanded leaf lets of plants grown from the these same tubers. Propoplasts from the epicles were Meristematic in appearence, of varying size, and showed characteristics traversing of the vacuolus by cytoplasmic stands. They were Extremely fragile and did not survive for for more than 3 days when cultured in vitro.

- - WATER SOLUBLE GALACTAN

149. WOOD (P J) and SIDDIQUI (I R). Isolation and structural studies of a water soluble galactan from potatotubers Carbohydres 22,1; 1972; 212-20.

The result suggest a galactan of about 60 B (1 - 4) linked D - galactophra nose resdves containg 2 - 3 (1 - 4,6) linkages. This requires a mol. wt. of just under 10,000 for the poly saccharide which a consistent with the fact that a synthetic boundary cell was necessary for sedimentation analysis.

- LATE BLIGHT DISEASE

150. BLACK (W). Nature and inheritence of field resistance to taste blight in Potatoes. Amer. Potato. 5. 47,3; 1970; 299-88.

Field resistance to late blight in hybrid derivatives of the wild species solamm demissum is a complex character, controled by many different genetics factors and in inherited in polygenic fashion. By inter crossing approporiate selections the resistance factor may be reassembled and field resistence built up to a level of high enough to make protective spraying unnecessary.

- LEAF - EFFECTS OF CHOLINE

151. BOKAREV (K S) and IVANOVA (K A). Affect of some derivatives and analogeous of choline and betaine on the content offree amino acids in the leaves of Potato species with different frost resistance. Plant Physoil 18,2; 1971; 365-68.

The content of free amino-acids was found to be 105 times higher in the frost resistent sps, solanum schreiteri then in the susceptible sps, S tuberosom Treatment of both sps with chlroethy trimethy lammanium chloride betaine chloride, Nimethy - N- acids particularly proline, serine and Glycine. These results are discussed from the point of view of the positive effect of some derivatives and analogous of choline and betaine on Plant frost resistence.

-EFFECT OF CHOLINE AND

BETAINE

152. BOKAREV (K S) and IVANOVA (R P). Effect of derivatives and analogues of choline and betaine on the qualitative composition of quaternary ammonium basis in potato leaves. Fiziol Rast. 17,5; 1970; 1070-75.

Germination of the seeds of 2 potato spp. S. tuberusum and S. Schreiteri. a wilding resistant to frosts was carried out on sulution of acetylcholine chloride (A c) Betaine monochy dr drate (B M H), choline chloride (CC). Leaves of 30-35 day old seedling were analyzed by paper chromatography.

- -VIRUSIN SECTION

153. MELLOR (Frances C) and SMITH (Richard Stace) Heat stable strains of potato leaf rull virus Phytopathology. 61,2; 1971; 246-47.

Potato leaf rull virus (P L R V) and potato Virus S were eradicatedfrom potato by growing infected plants at 35-36 C for 4-14 wk. then excising axillary buds for nutrient culture. Retention of P L R V in 3 cultivars ranged from 0-16% of the plantelets.

- - LET TEST

154. SUKUMARAN (N P) and WEISER (C J). Excised leaf let test for evaluating potato frost tolerance. Hort Science. 7,5; 1972; 467-68.

A simple reproducible procedure is described for assessing frost injury of potato foliage in volving controlled freezing of excised leaf lets and measurement of leached electrolytes. Test results are shown for 5 tuber bearing Solanum spp. representing a wide range of frost tolerance. The test can be used in selection and breeding for frost tolerance in potato.

-MATURING CORK CELLS.

155. RAINBOW (Arnold) and WHITE (J B). Preliminary observations on the Ultra structure of maturing cork cells from tubers of solanum tuberosum L. New phytol. 71,5; 1972; 899-902.

The normal cork of young tubers of S. tuberosum L. CV. was used as a source of maturing cork cells. The cells are preclimally flattened and highly vacuolated cytoplasm although sparse in rich in mintochondria, ribosomes, membrane bound vesides. No pits are visible but evidence that plasmades matabese present learlier in the ontogeny of cells. Cork cell formation is also seen.

-METABOLISM OF DEHYDROISOA AND STEROIDS

156. SCHNEIDER (John J). Metabolism of dehydroso and rosterone and other steroids by surviving. Stices of the Potato tuber and additional Plants tissues J. Bio l. Chem. 245,20; 1970; 5505-10.

The conversion of dehydroisoand roste rune to its B-D- glucopyranoside is readily effected by surviving slices of the potato (Solanum tuberosum) tuber at PH 8. Steric requirements involued in the synthesis and hydrolysis of a no. of steroidal B-D- gluco phyranosided by potato slices and their hydrolysis by emulsion have been defined.

-MUTATION

157. MEZENTSEV (A V). Production of somatic mutation of the potato by means of electrons, x rays and r rays. Referativnyi Zhurnal. 11,55; 1972; 309-12.

Tubers Lorkh and Volga was irradiated with electrons and with x rays r rays. The frequency of recessive tuber colour mutations in volga with 18-20 KR electron irriadation was equal to the frequency of mutations after x and rirradiation.

-BY GAMARAYS

158. ROER (Lars). Mutations in potatoes induced by gamma radiation Hag Phytica. 16,3; 1967; 283-82.

The reports deals with exps in which gamma viradiation was induced to apply somatic mutations in potato clones. The best results are obtained when an viradeation dose of 3200 R is applied. Most of the aberrants recognized were color mutations or leaf mubation. The possibilities of using artificial induction of metabolism in Potato breeding are briefly disenssed.

-NEMATODE RESISTANCE.

159. PANTYUKHINA (L A). Results and prospects of breeding nematode-resistant potato varieties. Referativuyi Zhurnal. 12,55; 1976; 57-61.

At the Betonuesian potato institute work has been in progress since 1955 on the production of forms resisteant to Heterodera rostochiensis using the hybrids of S. Andigeneuun. and General varieties and demissoids as initial material. The main result hitherto has been the production of the resistant late variety Ariadne.

-OZONE INJURY

160. GENTILE (A G). etc. Susceptibility of Lycopersicon Spp. to ozone injury. J. Amer. Soc. Hort. Sci. 96,1; 1971; 94-5.

Accession, Breeding lines, and varieties were elaluated for sensitivity to control cones. of 03 and to ambient. air at Waltham, Massachusetts. The Lant material was exposed in different stages of development to controled O_3 cones. of 0.25 PPm for 3hr 0.05 PPm for 2 wk and to 0.10 PPm was seperated into tolerant, inter mediate and sensitive plocetiax.

-PATHOGENICITY OF PHIZOCTONIA SOLANIKUH.

161. SPENCER (D). Assessment of pathogenicity of Rhizoctonia Solani Kühn to the potato plant Potato Research 17,3; 1974; 352.

Tests using attached sprouts were considerd to be the most reliable method of assessing the pathogenicity of Rh. Solani to tubers No. isolate behaved identically in all tests and only two showd definite frends.

– PATHOGENS GENETICS

162. KAMERAZ (A) etc. Genetics of resistance of the potato to pathogens. Defensiva Journal 5.55; 1976; 253.

Resistance of potato to virus disease phytophora and nematodes are examined. The types of resistance and and genetic controls are discussed and an account in given of promising initial material for breeding resistant varieties.

– PEROXIDASE ACTIVITY

163. YAMAMOTO (M) and OSEN (S). Alterations in peroxidase activity of potato tuber tissue treated with RNA fraction of different varieties and blight culture filtrate. Annals of Phytopathological society of Japan 42,3; 1976; 337.

In Benimaru treated with the RNA fraction of the resistant interspecific hybrid 1506 b (9) before treatment the filtrate peroxidase activity responded in a similar way to that observed in 1506 b (9) after filtrate treatment and betan to increase after 3 hours.

–PHOTOSYNTHESIS AND CHARACTERISTIC OF SEED

164. ROZIERVINOT (Claude Jeanne). Growth of leaves photo synthesis and characteristic of the seed tuber in potato (S. tuberosum) L. Physiolveg 8,4; 1970; 615-39.

Tubers aged from 3 mo. to 14 mo. weighing 30g or 120g. were studied. The tubers were cultivated in an air conditioned room. The surface, chloro phyll content and the photosynthetic intensity of the terminal leaf lets were observed. Maximum surface was reduced more quickly when the tuber was older or the amount of reserved available for 1 stem was smaller.

—PICLORAM ABSORPTION

165. BAUR (J R) and BONEY (R J). The uptake of picloram by potato tuber tissue. Weed Sci 18;1; 1970; 22-24.

Pretreatment of S. tuberosum tuber discs in PH 55 buffer significantly reduced uptake of picloram (10-3 M). Tissue Pretreated in buffer at 7°C subsequently absorbed more picloram than tissue pretreated at 25°C . The result suggested that picloram. Uptake by potato tissue is related to the availability of the quaternary ammonium binding sites provided by membrance phosphatase.

—POLY PLOIDY - EVOLUTION

166. HAWKES (J G). Evolution and Plyploidy in potato species. In HAWKES (J G), Edg. Symposium on Biology and Taxonomy of the Solanum (Birmingham) (1979), 7; 637-44.

A discussion of the nature of polyploidy. In Potatoes centres on the mode of origin of polyploidy servies in different groups of servies. The main evolutionary development in the tuber bearing solanums has taken place at the diploid level and polyploids do not form a very high Proportion of the total number of species. Furthermore, diploids seem to be just as a successful as polyploids amongst the wild species.

—PRODUCTION OF SEEDS

167. BUKASOV (S M) and KAMERAZ (A). Breeding and seed production of potato. Referativing i.z. 1973; 359.

The systematic of solanum is outlined and the breeding of varieties for resistence to Phyto Phthora and other fungous and bacterial diseases virusses, eelworms and Physio-logical disease and unfavourable external factors is considered. Other aspects include the breeding of early crop varieties and of varieties giving two ~~one~~ P. a year breeding for chemical composition of the tuber, breeding methods, crossability between the species of different series, and seed production

—PROPERTIES OF LIPOLYTIC ACYL HYDROGLASE

168. GALLIARD (T). Purification and properties of a lipotytic acylhydrolase from Potato tubers. Biochem 5 121,3; 1971; 279-90.

The specific activities of the potato enzyme with galactolipids were at least 70 mills higher than thos those reported for a homogeneous galactolipase enzyme prified from runner bean leaves. The possiblity that a single lipolytic acyl-hydrolase enzyme is responsible for the deacylation of several classes of acylipid is discussed.

—PROTEASE INHIBITORS

169. HOCHS TRASSER (Karl) and WERLE (ENGen). Plant protease inhibitors. v. The isolation and characterization of some polyvalent protease inhibitors from solanum tuberosum. Hope. seller's. a. Physoil. chem. 350,7; 1969; 897-902

The total antitrypsin. Activity of crude potato extract was isolated by selective binding to trypsin resin. A serics of components, exactly equally actige against trypsin, were seperated by chrome to graphy. The trypsin inhibitors of molecular wet 24,000 also inhibited plasmin. All the components strongly retarded natural blood clotting.

—PROTENINASE INHIBITORS

170. KIYOHARA (Toshifumi Terwoi wasaki). and MITSUYOSHI (yoshi Kawa) Purification and partial characterization of a protein ase inhibitor from potatoes. Bull. Rep. Fac Agric Kobe UNiv 10,1; 1971; 115-21.

Aproteinase inhibitor was isolated in crystalline form from potatoes by precipitation with ammonium sulfate, chromalography on carboxymethyl sephadex C-25 and get filteration through sephadix G100. The crystalline preparation was found to be homogenous on storch get electrophoressi. at PH 9.9 in presence and absence of 8M urea. The inhibitor was very stable inthe acidic PH range.

-PROTIENS

171. STEGEMANN (H). Characterization of proteins from potatoes, and the Index of European. Varieties. In Hawkes (J G), Eds. Symposium on biology and Taxonomy of the solanaceae (Birmingham) (1979) 7; 279-85.

Attention is drawn to basic features for applying electrophoretic methods to chemotaxonomy constancy or change of protein patterns from potato tubers and leaves are illustrated as well as properties of, and immunological relationships among, protein fractions of S. tuberosum.

-RADIOSENSITIVITY - GAMMARAYS

172. SHALDOROV (Y U) etc. Radiosensitivity of potatoes to gamma - rays and protons applied to the whole tuber and eyes before planting Kosm. Biol. Med. 2,5; 1971; 14-19.

Results are given of a study performed with respect to the effect of preplanting viradiation of potato tubers and eyes (isolated with a small endosperm portion) with Co 60 gamma - rays and Mev. protons on the plant growth and development. The effect of viradiations on the eyes was lower than that of tubers, the inlibitory effect of the proton radiation being higher than that of the gamma rays.

-RESISTANCE

173. OZERETSKOVSKAYA (O L)etc. Vertical resistance of potato to phytopthora infestens and the formation of phytoalexins Referativnyi Zhurnal. 4,55; 1976; 286-291.

In a study of 20 varieties with different R genes the tissue of tubers and leaves of plants infected by incompatibleraces were found to contain two bicyclic resquiterpenoid phytoalexins.

-RESISTANT - TEST

174. VINDER (Jan). Results of the primary test for the resistence of wild potatoes to potato roots elworm. Ved. Pr. Vyzk. Ustavu. Bram-Boresk. Havlikove. Prode. 4; 1970; 37-44.

Out of 359 forms, 34 were free from nematodes; of these were 21 forms of S. andigenum, 3 of S. acuale, 2 each of S.demissum and S. stoloniferum, and 1 each of S. acroscopinum. S. antipoviezii S. arago - papa, S. prachycarpum, S. schreiteri, and S.terijense. The potato root eelworm, since in many cases the absence of cysts was caused by ecological conditions.

_ROOT KNOT - NEMATODE - CONTROL

175. RAJ (B T) and NIHULA (K K). Soil treatment for the control of root - knot nematode on potato (Solanum tuberosum L). Indian. J. Agr. Sci. 40,10; 1971; 878-82.

Temik, phorate, disultotion, zinophos, and nellite at the rate of 5 kg./ha nemacide at 25%/ha, and Vapumat 285 l/ha were tested for the control of Meloidegyne inognita (Potoid and white) cchitwood on potato. No tuber infestertion was found in the plots treated with temik.

_SCAB RESISTANCE OF HAPLOIDS

176. CIPAR (M S) and LAWRENCE (C H). Scab resistance of haploids from two S.tuberosum cultivars. Am.Potato.J. 49,5; 1972; 119-21.

Haploids were extracted from the tetraploid potato cultivars and subjected to tests of their resistance to the common scab disease (Streptomyces scabies). The distribution of haploids according to the scab reaction was significantly different from that of Avon haploids. The farmer distribution was showed strongly towards high levels of resistance in contrast with the large susceptible class among Avon haploids.

_STARCH SYNTHESES

177. HAWKER (J S) etc. Unprimed starch synthesis by soluble ADP glucose starch glucosyltransferase from potato tubers. Phyto Chemistry. 11,4; 1972; 1287-93.

Soluble ADP glucose ; x 1; 4-glucen x - 4 glucosyltransferase from potato tubers was purified by chromatography on DEAE cellulose. The enzyme transferred glucose from ADP glucose to severasl glucan primers. In the absense of added primer in a reaction mixture containing sodium citrate and borine serum albumin.

_STOLEN DEVELOPMENT - CONTROL

178. KUMAR (D) and WARRING (P F). Factors controlling stolen development in the potato plant. New phytol. 71,4; 1972; 639-48.

The development of the basal axillary shoots of solanum andigena as stolons is dependent upon their being subject of apicall dominance In rooted stem cutting, basal axillaries not subject to apical dominance grows leafy shoots, but if the roots are removed they develop as stolons. Thus, axillary, shoots not subject to apical dominance are converted from stolons in to leafy shoots by some influens of the roots Axillary in the aerial part of the shoot may be stumulated to grow out as stolons by applying GA to the stem.

—STORAGE

179. LAUER (Florien). Possible genetic source for chipping potatoes from 40 F storage. Amer Potato J. 47,8; 1970; 275-78.

An interspecific hybrid of S. phureja, a haploid of Katahdin produced acceptable potato chips when processed directly from 40 F storage during 3Yr of testing. It was crossed with 11 interspecific hybrids. Tubers from these progenies were stored for 5 MK at 40 F and their chipped immediately for 55 Sec. A group of 600 seedling from S. tuberosum parents ftreated comperably produced blank colored chips with out exception.

— —of POLLEN

180. MAINE (M J). A simple technique for the short term storage of pollen of a diploid inducing diploid potato clones Journal of Agricultural Science 89,2; 1977; 511-12.

Functional fertility of pollen of the Dutch solanum phureja clone IVP 48 extracted from anthers and stored desiccated and deep frozen was similar to that of fresh pollen when used in dihaploid induction crosses on tetraploid potatoes with un predictable flowering times.

—STRUCTURE OF GAURD CELL

181. MIROSLAVOV (S A). Ultrastructural organization of stomatal guard cells; Mechanism their movements Bot ZH 56,4; 1971; 485-92.

Study of guard cells in S. tuberosum, cucumis Sativus, Phaseolus sp. Allium Cepa. was carried out. Substantial difference in the stomata were observed among the plants studied. These difference pertained to the structure of the chloroplasts and endoplasmic reticulum to the contents of vacuoles and some drops of lipids.

_STUDY OF ADI - ISOTRIOSOMIC

182. LAM (S L) and ERICKSON (H T). Adi-isotrisomic of a diploid potato J. Hered. 61,3; 1970; 103-5.

Morphological description and cytological identification were made on a secondary type of trisomic in solanum chacoense. The trisomic plant in which one of its chromosome 12 pair is replaced by 2 isochromosomes, each consisting of the long arm of the same chromosome, is tentatively termed a di isotrisomic.

_MITOCHONDRIA

183. DOUCE (Roland). Preparation of infect plant mitochondria. Biochim Biophys Acta. 275,2; 1972; 148-60.

Mitochondria from mungbean (Phaseolus aureus) hypocotyls and potato (S. tuberosum) tubers were seperated from contaminating organelles and membrance fragment on discontinuous sucrose gradients After removeal from the centrefgue tubes only intact mitochondria survived dilution to 0.3 M Sucrose . The influence of purification on oxidative capacities and carrier concentrations were detailed.

_PHOSPHORYLASE - ISOENZYMES.

184. GERBRANDY (S J) and ANGELI (Georges) Potato phosphorylase isoenzymes. Phyto chemistry. 11,8; 1972; 2403-7.

This enzyme were separated by a gel electrophoresis, and DEAE sephadex chromatography. Molecular wt. And stockes radio were estimated using Sephadex G 200. The adsorption on on glycogen of 2 low molecular weight forms probably dimers, was investigated by means of gel electrophoresis.

_PLANT HIEGHT AND FLOWERING

186. ABDALLA (M M F). Inheritance of plant hieght and flowering time in the wild potato spc. S. Verrucosum euchlorhtd. Genetica. 42,4; 1971; 393-403.

The inheritence was studied of plant hieght and flowering time in a hybrid between the short stemmed, late flowering of (S. Verrucosum) and tall stemmed, early flowering of the same species. The range of plant height in first case served as a criterion in classifying the populations into tall and short plants frommeasurements at 4 growth stages. Late flowering appears recessive to early flowering. The segregation ratios can be explained on the basis of 2 complementary dominent genes for early lowering.

-VIRUS- STUDY OF VIRUS STRAIN

186. MELLOR (Frances ") and RICHARD (STACE- Smith) Virus strain differences in eradication of potato viruses x and s. Phytopathology 60,11; 1970; 1587-90.

Virus free plants of 18 cultivars of potato (S. tuboro-sum) were developed by evadicating potato virus x and potato virus S from infected plants. The viruses were eradicated by heat treatment followed by nutrient cultural of axillary buds. 0.8-0.8 mmlong. potato virus x was usually eradicated more readily than virus S. but ease of eradication of both viruses varied with the source plant.

-STUDY ON POLYISOPRENOIDS

187. TOYODA (Masashi) etc. Studies on plants polyisoprenoids. III. Polyisoprenols of potato leaves. Nippon. Nogeikagaku. Kaishi 44,6; 1970; 257-61.

The isolation and properties of a new acyclic C 25 prenol of potato leaves is described. The C 25 prenol is identified as a partially saturated prenol with a phytyl group to which a cis OH terminal isoprence residue is attached solanesl also found in the leaves of potato. α-Methylenic protons of OH isoprene residue gave peaks at 5.97, 5.98 5.94 etc.

-SUGARS LIPID - VARIATIONS

188. JARVIS (N C) ETC. Variations in free sugars and lipids in different potato varieties during low temp. Storage. J of science of food and Agriculture. 25,11; 1974; 1405-9.

When tubers of ten Varieties were held at 18°
and 4°c for 86 days both reducing sugars and
sucrose levels rose at the lower temperature
but the proportion of sucrose to reducing sugars
decreased. The ratio of total sugar at 4°c to
that at 18°c averaged 2.2 being 1.0 in pientand
Ivory but 4.4 in Desiree.

-TISSUE AGEING

189. HOURANT (Annick) and MICHEL (Penot). Change of 86 Rb. permeability according to ageing of tissue in solanum tuberuseum influence of calcium CR Sciences Soc Biol Fil 165,8; 1972; 1756-49.

The 86 RB absorption level is higher on fresh tissues than on aged tissues. It could be the matter of ionic specificity. More over the inhibitory action of Ca2 + on the absorption of Rb + is attenuated in aged discs. This inhibition by an increase in efflux in presence of Ca +2.

-TUBER INITIATION

190. HAMES (P J). Tuber initiation in the Potato (S. tuberosum L.). Agroplante. 5,4; 1971; 73-4.

The Relation between photoperiod and growth substance on the mechanism of tuber initiation was studied. Experiments were conductel in plant growth chambers withthe cultivars up to date Plants were grown under non-indvetive Photo peroids (18 hrs) at day and night temperatures of 20 and 15°c respectively. Tuber initiation is apparently controlled by a balance between endogenous gibberellins and some other unknown substance (S). either a specific tuber forming substance, or some endogenous inhibitors (s) of gebberillin. or both, may play apart.

-VIRUS

191. ZADINA (J). S. demissum A as indicator plant for diagnosing potato virus A. Indikatorova rostline prodiagnozu A viru bramber Ochrana rostlin 12,3; 1976; 165-70.

In dish tests reaction of solanum demissum. A to potato virus A, characterized by tinynecrotic lesions, was specific. Viruses X, S, M and Y caused no reaction The diagnosis is more efficent on sprouts of tubers stored at temp up to 18°c than on the leaves especially if these are exposed to higher temp (in July and Aug.)

-VIRUS X ACULE

192. SKLYAROVA (N P) and YASHINA (I M). Inheritence of resistence to potato virus Yin solunum aculeatum bitt. Genets 6,11; 1970; 57-63.

S. aculeatum the F_2 hybrid S. aculeatum + Punae xf gibberolesum (ux) indicated that only 1 dominant gene controls this trait. Stable species are obtained from s. aculeatum and the F_3 and F_4 S. aculeatum f. Punal x.f. gibberolesum (4x).

-ACTIVITY OF GLUTAMATED CAR BOXYLASE.

193. KUSHNRENKO (O A) and SKOFENKO (A O). Glutamatedecarboxylase activity of plants infected with potato X -virus. Mikro Biol eH (K XXIV)

The effect of potato x -virus and its strains of the different virulence. On plants of the family solanaceae was studied. Inhibition in the glut amatede carboxylase activity (60 -80%) was observed at early stages of infection. Maximum inhibition was observed during the period of virus reproduction.

-CHEMICAL CONTROL OF COLORODO BEETLE

194. BEETKE KSIAZEK (D) Spread of potato viruses and chamical control of colorode beetle. Referativnyi Zhurnal. 174; 1976; 127-43.

The degree of infection invere. Lisino and Spoke, treated with 0.4% tritox and 0.1% endophos 50, was determined serologically before planting 2-3 times during growthand harvest by using antisera to viruses M,S,X and Y. In the field no difference was observed in virus infection on treated and untreated Plots. Spread of viruses was max. at the e end of June when plants were sprayed against the bettle at the begining of July. The general decrease in yield (in dependintly of chamical treat ment) resulting from virus infection was 45% weeds were more abundant in the untreated control but viruses M and S were not found in 828 weed Plants tested. In the Glass house chono Podium album was susceptible to mands and solanum nigrum to M.

- DETECTION

195. MCCRUM (R C) etc. Microslide Ouchterlony technique for serological detection of Potato virus A Phyto Pathology 61,3; 1971; 290-2.

Microslide ouchterlony method employing plastic templates enabled the detection and comparison of strains of intact, native, Potato virusx, crude Jince - salive Extracts of Potato (S -tuberosum) and Nicotinia glulinose as well as antigen sources in obtaining possitive reaction, inget double - diffusion tests against a commeverally available source of antiserum.

- EFFECTS OF TEMPERATURE

196. DEBOKK (J A). Affect of temperature on the development of local lesions on A6 leaves after inoculation with potato virus A Potato Res 13,3; 1970; 467-474.

At low temperature tiny necrotic spots appeared on S, demissium A 6 leaves. Here as gross ster like lesions developed at higher temperture No lesions appeared at 28°c. High number of local lesions and high percentages of test leaves showing lesion were obtained when the test leaves were incubated at a temp between 15° and 20°c.

- GENETICAL STUDY

197. COCKERHAM (C). Genetical studies on resistence to Potato viruses x and y. Heredity 25,3; 1970; 309-48.

The genetic control ofextreme resistence and necrotic reaction to potato virus x and Potato virus y in several species of tuber - bearing solanaceae is demonstrated with emphasis on relationships between some of the genes concerned. The significance of the generelatin ships to evolutionary studies is discussed briefly.

- VIRUSY

198. IKAUNIETSE (L). Study of potato Y- virus strains in Latvian SSR. Trlatv S - KHAKAD 40; 1971; 85-89.

A virus strain designated as the Y -28 was isolated from potatoes of the Iastella variety. This strain was verified on 4 indicator plants S. demissumhybrid A and S. Chacoense were the best differentiating plants. The point of thermal activation was 59° and the optimal concertration was 4 10 - 4. Strains Y - 28 is a typical strain of the Y - virus.

WILT - EFFECT OF FUMIGATION

199. BAXTON (G D H E) etc. Effect of annual soil fumigation and preharvest vine burning on verticill ium wilt of potato. Phytopathology. 62,5; 1972; 520-25.

Annual spring fumigation for 5 years reduced populations of V. albo -atrum in field soild, delayed in fection and wilt symptoms and increased yield of solanum tuberosum L. Result of annual combination treatment of soil fumigation and vine burning were similer to these for soil fumigation alone.

YIELD LOSS BY LATE BLIGHT

200. JAMES (W C)etc. Evaluation of a method used to estimate loss in yield of Potatoes caused by late blight phytopathology 61,12; 1971; 1471-76.

The fungoide dipolation 4 Flowable which did not affect tuber yield except by controlling late blight was used to inluence 5 different epidemics by operating various spray schedules. Actual losses 42, 53, 52 and 26, derived by weighing were in poor agreement with the estimated losses 23, 10, 16 and 0% respectively computed by the method.

SIDA - CHROMOSOME NUMBER

201. AVERETT (John E) and POWELL (Michall A). Chromosome number in physalis and solanum. Sida Contrib Bot. 5,1; 1972; 3-7.

Tables are given showing chromosome numbers and locality date for specimens for a nedumber of species and varieties in each genus. Except for n = 11 in P. lobata chromosome number presented here for 18 taxain these genera. Most of specied were examined werediploid substantiating the rarity of polyploidy in physallis solanum and related genera. The distribution of tetraploid and diploid P. lobata is mapped.

SOLANACEAE - ALKALOIDS

203. NICHIE (K) etc. Positive inotropic action of solanaceae glycoalkaloids. Res Commun Chem. Pathol Pharmacol. 15,3; 1976; 501-508.

Six glycoalkaloids and 1 aglycone were tested for cardiotonic activities and compared with K-Strophanthoside by use of the isolated frog heart The decreasing order of potency was as follows K - Strophanthoside > tomatine > K - Chaconine = K Solanine > dismissine = commersonine > Bohsconine > solanidine. Cardiotonic activities was directly related to the number of sugers in the molecules in which the glycoalkaloids had a common aglycone.

-AMMONIUM TOLERANCE

204. HERMAN (E) etc. Studies on the Ammonium tolerance of some cultivated solanaceae. Amer. Soc Hort. Sci. 95,3; 1969, 345.

Stem lesions, analogous to those which appear on tomato during ammonium toxicity, were formed on egg plant but not on other species.

-ANTIMICROBIOL SUBSTANCES

204. SABER (M S M). Antimicrobial substances in certain members of solanaceae; V. detection of active principles in potato plant. Zentralbl Bakteriol Parasitenkd infektion skr Hyg Z weite Naturwiss Abt. 131,2; 1976; 113-18.

Bioautographic analysis of the various chromatograms prepared from potato plant (Solanum tuberosum) showed 14 spots with antibiotic activity towards both S. (Staphylococcus) aureus and C (candida) utilis. While all the active spots were present in the leaves only 4 and 8 spots were detectable in the roots and stems respectively.

-AUSTRALIAN GENERA

205. HAWKS (L). Australian genera of the solanum In HAWKES (JG) Eds, Symposium onbiology and taxonomy of the solanaceae Birmingham (1979),7.

Only three groups of solanaceae are well developed in Australia-Solanum with about 70-90 endemic species and Nicotiana with 20 endemic species are represented elsewhere in the world. The restricted apparently relict distribution of many of the species support the notion that the group is an old one which diverged early from a solanaceous stock ancestral to the tribe cestreae.

-BIOSYNTHESIS OF CHLOROGENIC ACID

206. PARMENTIER (F). The biosynthesis of chlorogenic acid in solanaceae. In HAWKES (J G), Eds. Symposium on Biology and Taxonomy of the Solanum (Birmingham) (1979) 7; 269-72.

Evidence for a biosynthetic pathway from L- Phenylalanine through cinnamic acid, p-coumaric acid and 5-O-p-coumaryiyvinic acid to chlorogenoc acid solanum.

-BOTANICAL LITERATURE - ARGENTINA

207. ARROYO (Silvia Cristina) Solanaceae in the botanical literature Argentina. Bot. Soc. Argent. Bot. 17,1; 1976, 25-30.

It is established that the material which lead to citations in botanical literature of argentine actually corresiponds to other local entities, F. patogenicsever. patogenics of F. peckii, as the first mentioned spe seems to inhibi only a limited area in the province of coquimbo, chil. The difference between the spp. are given, as well as a map of their approximate geographic distribution. A discription and illustration of F.viscosa is added.

-BRANCHING

208. ALAHCHILD. A review of branding pattens in the solanaceae. In 345-56.

The range of branching patterns in the reproductive phase of the solanaceas in reviewed following the schemes of Eicher and the papers of Emert. A possible evolutionary pathway is traced and the particular types of branching are survived and correlated with genera and subgenirie tax of solanum L, which are known to the author.

-CLASSIFICATION

209. D'ARCY. Classification of solanaceae. In HAWKES (J G) Eds, symposium on Biology and taxonomy of solanaceal (Beimghamm) (1979) 7; 3-32.

Development of thought on the classification of through on the losmaceae is traced from classical times to present day. phytogeographical date indicate the strong concentration of the feily in south America and the tendency to endemism of tribes and geneare indistinct areas throughout the world. The value of experimental studies prticularly biochemical ones in helping to elucidate classificatory system is emphasized.

—FLAVONOIDS

210. HARBORNE (J B). Flavonoids of Solanaceae. In HAWKES (J G) Eds Symposium on biology and taxonomy of the solanaceae (Birmingham) (1979) 7, 257-68

Flavonoids have been fully characterized in several crop plants notably the potato tobacco and petunia but little is known of the patterns in wild species. The two flavonols Kaempferol and quercetin are universal occuring often as the 3 glucosides and 3 - rutinosides more complex triglycosides are common in solanum. From the systematic points of view flavonoids are of interest in indicating that the solanaceae is some what isolated from most of the neighbouring families.

—INDIA

211. DEB (D B). Solanaceae in India, In HAWKES (J G) Eds, symposium on Biology and taxonomy of solanum (Beringham) (1977) 7, 87-110.

Solanaceae in India are represented by 24 genera of which 10 are native. There are 103 species recorded of which 53 appear to be native 16 naturalized 40 cultivated and 19 cultivated experimentally. Maps are also given for recorded species.

—INFECTION OF PSEUDOMONAS SOLONA-CEARUM

212. GOUDA (T K S) etc. Studies on the bacterial wilt of solanaceal crops caused by Pseudomonas solanacearium. E.F. Smith inwilt sick soil J. Agri. Sci. 8,4; 1974; 500-66.

Results are presented of studeis on the infectivity of P. Solana-cearum population on the dehydrogenase activity in wilting and nonwilting cvs. of bringal (egg plant).

—MORPHOLOGY - EMBROLOGY

213. MOHAN (Karuna). Morphological studies in solanaceae. The development of ovule and embryosac in S. Khasianum clarke. J. Res. Sci. 19,3; 1971; 39-44.

J. Khasianum is medicaly important plent. The ovules are anacompulotropus unitegnic and tenuinucllate. A single rarely 2 archesporial cells. A linear row of 4 cells . In stanges of bisporic embryosac development of Allium and Endymion types have also been recorded. The cells of nucleus break down resulting in the developing embryosac. Coming in contact with the endothecium.

—ORIGIN OF NEW VARIATIONS

214. HASSLER (E). Solanacia paraguariensis critica velutinus cognita. Rep. Sp. Bot. Ann. 15,1022 1918; 113-21.

Solanaceaes plants occuring in paraguay gives critical notes on light species of solanum together with the extensive citation of synonyms and Exsiccatae. The following varities new to science and new varietal combinations Occur Solanum nudem, H B K. Var. Pseudo - issdigoferum. Var. micranthum (S. microan thum) S. Verbascifolium L. war typic chm. S. forum.

—PHYTOCHEMICAL STUDY

215. CONI (C). Phytochemical study on solanaceal of central africa Plant Med. 34,3; 1977; 241-56.

States that seven glycoalkaloids dovived from tomatidenol were extracted from fresh leaves of an african solanum. S. dasy phyllum. Thonn.entlivated in a botanic garden from seeds collected in rwanda) Four of these glycosides were identified as soladul camarin and a, b and r - solamarin.

—SOMATIC PROGENY

216. UNUCHKOVA , V. V. Experiment formation of somatic progeny of chemiric plants with a mixoploid chromosome set in the solanaceal family. Genetika. 13,8; 1977; 219-16.

States that from interspecific chemeric plants of the solanaceal family. Namely black nightshade (solunum nigrum L) x tomato (Lycopersicon esculetum mill) somatic progeny was obtained by means of tissue culture. It was represented both by changed among the somatic progeny were chromosomal aberrations in the tissues of the balck night shade component.of the chemeric plants obtained by grafting.

—SOUTH AMERICA.

217. HUNZIKER (Armando T). South American solanaceae ; a synotypic survey. Symposium (1979) 7,49-81. On Biology and Taxomy of solanaceae in (Bormigham) (1979) 7, 49-81.

This summarized the available data on taxanomy of south American solanaceae giving a key to the subfamilies and tribes. It provides an enumeration of tribes and genera with notes on certain species,their distribution and their habitats. Centres of diversity, levels of endemism and distributional peculiarities are also discussed.

—STOMATAL CHARACTERS

218. BROOKS (J) and GUNOT (M). Anattempt to me stomatlcharacters in systematic and phylogenetic studies of the solanaceae. 7; 311-26.

The study of epidermis of 56 species to 45 genera of solanaceae has enabled us to redognize most of the different stomatal tupes commonly desscribes in the dicotoly. dons (anomocyte type. Meso perigenous and meso-genous aniscytictypes. Mesogenous beiytic powacy lie types)

—STUDY OF HOST

219. BAROOTI (S). Prevalence and host range of root knot nomatode meloidogyne incognita in Esfah an area. Iran J. Plant pathol 10,3; 1974; 53-78,25.

The members of the solanaceae and cucur bitaceae f milies were among the most sensitive hosts those of the Graminae family, the least sensitive. Field studies indicated that at least 3 generations of the nematodes were produced a year. Nematode activity in the field occurs during May-Dec. E.M.D.

—TAXA

220. DARCY (W G). New names and taxa in the solanaceaae. Ann Mo Bot GARD 63,2; 1976; 383-89.

Nicotiana autleri D' Arcy belonging to subgenus Rustica, Sect. Paniculatae; witheringia exiguiflora D ' Arcy and ... moril D 'Arcy are newly described spedies. Two new combination are madi Jaltoma viscosa (schrad) D ' Arcy and Davis (Lorecha viscosa) and Dyolanthes sanctaclarae (Groenman) D 'Arcy (Solanum Sanctaclare) Solanum stramonifolium is newly recorded for Panama.

—TAXA

221. D ' ARCY (... G). Solanaceae study. Ann. Mo. Bot. Gard. 57,2; 1970; 358-63.

Two taxa are discussed solanum carolinense var. floridanum and Brun felsia dwyeri species. Nov. The new species is a small tree with large, showly flowers. It occurs in central panama as a remnant mature forests are cut.

—TORPANE ALKOLOIDS

222. EVANS (... C). Tropane alkaloids of the solanaceae in symposium on Biology and taxonomy of the solanum (Birmingham) (1979) 7; 241-52.

The review covers the distribution of tropane alkalids with in the plants kingdom and more specifically their occurence, chemical structure and biosynth esis in the family solanaceae. Some clearcut chemotaxno nomic features are evident. All spaies of the suberibe Hyoscyoninate contain prince pally misture of the hyoscine-hyoscyamine type alkoloids, Alkaloids of the tigloyloxytro pave type, Alkaloids inheritance inverious hybrids of nature species is discussed.

INCANUM - SOLASODINE CONTENT

223. LAITCHEK (D V) and SEGAL (Ruth). The solasodine content of solanum incanum. Lloydia. (DINDI)

Ripe fruits, unripe fruits, and leaves of s. incanum L. were examined for their solasodine contents. Solasodine was found to be present only in the unripe fruits- L.E.

SOLANACERUM - STUDY OF HOST

224. BELALCAZAR (Silvo) etc. Recognition of hosts of Pseudomonas solenacearum (E.F.Sm.), in colombia. Rev. Inst. Colombiano. Agropeurier. 3,1; 1968; 37-46.

33 Kinds of weeds common to the Bogota savvanah were isoculated with races 1,2 and 3 of the bacterium P.Solenaceum. Pathogenic to tobacco, banana and potato, respectively. Brassica compestris L. Datura stremonium L. and S. nigrum L, were susceptible to all three races; solanum cariponse to races 2 and 3.

SOLANINE - EVALAUATION

225. PATIL (B C) etc. Evaluation of solanine toxicity. Food cosmet Toxicol. 10,3; 1972; 395-98.

The I.P. LD 50 of solanine for mice was 32.3mg/Kg. Rabitts given 20 mg/kg i.p. Generally died with in 24 hrsand showed weak - to moderate inhibition ⁂ was less marked in non-specific chlinesterase. This inhibition was less marked in the ery throcytes than in the plasma in vivo. In an anesthitized dog given doses of 6 mg solanine. 1kg at 10 min intervals, an initial inhibition of serum chlinesterase was followed by rapid recovery white the dry throcyte enzyme was not affected.

SOLANUM - AUSTRALIA

226. SYMON (D E). Solanum in australian. IN HAWKES (J G) Eds. Symposium on biology and taxonomy of the solanaceae (Birmingham) (1979),7; 125-30.

There are about 90 species of solanum considered native to Australia of which all but 8 are endemic. Species occur in all except saline aquatic habitats. More species occur in the wet or dry tropics than in the southern temperate areas. Most species are short lived, subwoody herbaceous perennials whose above ground posts live for several years and regrow from clonal root systems There are few annuals and a few small trees. Tuber bearing species do not occur in Australia.

- BIOGEOGRAPHY

227. NEE (E). Pattern in biography in s olanum, section Acanthophora. In HAWKES (J G) Ede. Symposium on Biology and Taxonmy of s olanaceal (birmingha m) (1979)?, 569- 79.

The centre of origin is in s outh eastern south America. Four species are mapped and their ra nges discussed; similar p a tterns can be expect in other species of solanum. Dates of earhist collection, know ledge of relatio ns hips and variability wity in a s pecies are helpful in interpretting and ranges and histories.

BIOSYSTEMATIC STUDY

228. SIMMONDS (Jennifer H). Bios ystematic of s olanum L., section sola num (Maurella). In HAWKES (J G) Eds. Symposium on Biology and ta xonmy of sola - naceae e (Birmingha m)(1979)?, 529-46.

Experimental and numerical taxonomic studies have s hown that the section is taxonomically critical for general reason. Ma ny s pecies a re very vari- abl e genetically a nd can exhibit considerable pheno typics they f ormapal yplid se nes. Infra a nd intera pecific hybridization can occur leading to complex population variation, a nd the species also show in herent discordant variation. T here is considerable comenal etuna l confusion, largely resulting frm the publication of over 300 specific and intraspec ific po st - lia n n ne mes.

CLONAL PROPAGATION

229. ROGER (J) etc. R apid clonal propagation o f sola num curtilobum cv. Mallku by a sep tic shoot me ristemculture. In HAWKES (JG) de. Sympo-s-ium on Biology and taxonmy of Solanaceae (Birming ha m) (1979)?, 377-80.

Numerousadventitious meristems arose superficially on the small a mount of callus produced at the base o f the explant. Each of these meristem developed into a leafy shoot w hen the culture was transferred to medium w ith 0.1 mg dm gibberellic acid as the only growth hormone.

COLCHICINE TREATMENT

230. RAGHAVAN (J G T) etc. Aneuploids from natural a nd colchicine - ind uced entiotetraploids of sola num. Gen. J . Genet. Cytol. 12,3; 1970; 601-13.

Haploids grown from unfertilized egg. cells of a autotetraploids solanum (4x=48) were found to be either euploid (2x=24) or hyperploid (25 through 28 chromosomes), the proportion of hyploids being 7.6% or S. tuberosum. group tuberosum, 1.5% for cine - induced autotetraploid S. chacoense.

--CYTOGENETICS

231. ABDULLAEV (I K). Cytogenetics aspects of the assortment of original material for breeding. Dokl. Akad Nauk AzesR.28,1; 1972; 63-66.

Tables of polyploid series for the genera Morus Fragaria, solanum and Rosa are presented. Use of these as parental forms in breeding can pro--vide a new diversity of genotypes and new forms with good biological and agricultural characteristics.

--DISPERSAL AND SPECIATION

232. KEITH (Roe E). Dispersal and speciation in solanum, section Brevantherum. In 563-67.

Isolating mechanism, species hybridization and the general reproductive biology of species in section Breventhurum are briefly discussed the section is distributed widely in the Americasim and shown that the two areas of species diversity. Mesoamerica and the northern parts of south America.

--DISTRIBUTION OF GLYCO ALKALOIDS

IN CELLS.

233. ROODICK (JG). Distribution of steroidal glyco alkaloids in cells of solanum and Lycopersion In HAWKES (J G) Eds. Symposium on Biology and taxonomy of solanaceae (Bir) (1978) 7, 223-29.

Cell fraction have been obtained from various organs of solanum tuberosum and lycopersicon. Analysis revealed that in cells of both species glycoalkoloids were most abundant in soluble phase, present in smaller concentration in the microsomal fraction and usually not detectable in lower fractions. The significance of these findings is discussed in relation to the site of synthesis and possible function of these compounds also to cell membrane structure.

- - OF STEROIDAL ALKALOIDS

234. BRADLEY (V) etc. distribution of steroidal alkaloids in Australian species of solanum. In HAWKES (J G)ed. Symposium on biology and taxonomy of solanaceae (Birmingham) (1979) 7; 203-09.

84 species of solanum are examined & it found that the 20 spp., less than 0.1% alkaloid in any part of the plant for 34 spp. alkoloid in the fruits only and for 30 spp. alkaloids in leaf stem and fruits. We have isolated several new alkaloids in part i cular from S. callium and from S. dunalianum. The most important Australian species from the view point of commercial production of solasodine would still appear to be S. Laciniatum and S. evicul are.

- BIOSYNTHESIS OF ALKALOIDS

235. REINBERGER (H) etc. On the biosynthesis of isolanum alkalide from cycloartenol or lanosterol. phtochemistry. 10,11; 1971; 2699-2704.

After application of labelled cycloartenol and lanosterol respectively to S. chenopense bitt, lyc opers ken pimpinellifolium (Mast.) Mill, and S. pseudocapicum alkalide solanidine tomatidine and solanocapsine. was established in the case of tomatidine the radioactivity was localized in ring F.

- EVOLUTION

236. ANDERSON (Gregory J). Study stomatic and cytotaleonary consideration of species of solanum, section Basarthrum. In HAWKES (J G) eds. Symposium on biology and taxonomy of solanaceae (Birmingham) 361-81.

The section comprises one cultivated and 22 wild species. The cultigen, S. Ricetum has a long history of the use in the Andes of southern colombia, Ecuador and peru. It is proposed that the perunen S. Pseudopogonum could be involvidueals of S. maidiectum are self compatible, and most plants produce some fruitis with seeds.

- - AND VARIATION

237. ANDERSON (Gregory J). Variation and evolution of selected species of solanum section Basarthrum (Solanaceae). Brittonia. 29,2; 1977; 166-2 8.

Basarthrum were studied in an effort to clarify their taxonomic position and to determine the effective evolution ary mechanism. The only successful interspecific crosse involving I and crossing studies indicates a close relationship between S. Pseudopogum and S. cari pense. Hybrides between these 2 spp with relatively high fertility through the F3 generation were severed.

—GENOMEREL ATION

238. RAMANNA (M S) and HERMSEN (J G). Genome relationships in tuber - bearing solanums. In HAWKES (J G),Eds. Symposium (Birmingham) (1978), 7, 647-58.

Some evidence for genome differentiation in south American potato species is also presented this runs counter to general beliefs but appears to be indisputable.

—GRAFTS - STUDY

239. DANIEL (L). Studies on solanum grafts. Comp. Rend. Acad. Sci. Paris. 171; 1970; 1074-76.

Several grafts of egg plants upon to mato produced fruits of tomato shape, but with colour eggplant. There was little effect on egg plant In the 5,000 pp, chamber fresh and dry weight. Yield of plant were increased in tomato plants.

—GROWTH REGULATOR

240. HAMMOND (David H). Growth regulator interaction on morpogenesis in solanum species. In HAWKES (JG), Eds . Symposium on Biology and taxonomy of the Solanaceae (Birmingham) (1978) 7; 557-69.

Effects of such growth regulators as gibbonellin, bergy - adenine, N. dimethylaminosuccinamic acid (B_9) quercitin, and the effects of day length on leaf shape and lobing, spine information, and amount of branching on two species of solanum, S.seaforthianum. Andreus and S. capsicoides. All were investigated. Morphogenetic work in the solanaceae by others is briefly discussed.

—HAIR TYPES

241. ALMIT (Geithe). Hair types as taxonomic characters in solanum. In HAWKES (J G), Eds. Symposim on Biology and taxonomy of the solanaceae (Birmingham) (1978) 7; 307-19.

An analysis of the eight different hair types in S. is given. Including prickles and bristles variations according to the parts of the plants on which they are found and the time in the life of the individual on which they develop, are described. Dev. relationship between hairs are investigated. Multicellular glands are shown to be very district in their origins from cover hair and each of these is consider to be main hair class. prickles and bristaes are analysis in terms of basic types from which they are derived.

-HYBRID STERILITY

242. ELLISON (W) . Synaps is and sterlity in solanum hybrid. J. Genet. 52; 1958; 465-77.

Observed normal course of meiosis in S. Nitidibaccatum. In micosis there is small structure of the elnomosomes of the species. Play the minot rull in the evalution of genus rolanum.

-INCOMPATIBILITY - INCONGRITY

243. HERMSEN (J G) and OKKA (F W). Incompatibility and incongrinty in tuber - bearing solanum species. In 445-52.

Incompatubility is the in libilition of fusing of normal gametes wing to interaction of two mutually reactive identical proteins which are produced in pollen and pintil respectively. In tuber - bearing solanum species incompatibility is gameto phytically determined and based on either one or two loci.

-INHERITENCE OF RESISTANCE

244. MACDONALD (A) etc. Inheritance of resistance in solanum to the twospotted spider mite. J. Econ. Entomol. 65,5; 1972; 761-64.

A leaf disc technique was used to evaluate 5 wild solanum clones for resistance to Tetranychus urticae koch. The criterion used to quantify resistance and susceptibility was the number of eggs laid by female mites on leaf disc. The leaf disc technique appeared to be a rapid and accurate method of evaluating resistance to the two spotted spider mite in certain wild solanum clones.

-INTERRELATIONSHIP OF MELONGENA

245. BHADURI (P N). Interrelationship of nontuberiferous species of solanum with some consideration on the origin of brinjal. Indian J.Genet, 11; 1951; 75-82.

He produced fertile hybrids between S. melongena and S.incanum using latter as a female parent. However when S. melongna cross with S. xanthocarpum the hybrids were partialy fertile. S.melongena is more closely related to S. incanum. After this cross he get brinjal variety of more importence. It was partialy fertile one cross was successful.

-LEAF CELLS

246. CHEN (P) and LI (P H). Ultrastructural differences in leaf cells of some solanum spp. in relation to their frost resistance. Bot. Gazette. 138,3; 1977; 276-85.

Under 15- h days and day/night temperatures of 20/15°C The leaf cell walls of frost reistant spp. S. acaule were about twice as thick as and the chloroplast and more osmiophilic globli than those in S. tuberosum, a cultivar suceptible to frost damage S. tuberosum which cannot be acclimatized to cold. The chloroplast grana of S. acaule also changed with cold acclimatization.

-NEW SPECIES

247. ROE (Keith E). A revision of solanum section Brevantherum (Solanaceae). Brittonia. 24,3; 1972; 259-78.

The present revision of solanum sect. Brevantherum saithe recognizes 27 sp. in North and south America two of which have become naturalized in parts of the old world. Three spc. S. iltis S. Goodspeedii and S. appressum are described as new comparative morphology, geographical distribution provide evidence for species recognition buds leaves hairs which range from simple to porrect - stellate & more complex type.

-PLANT DEVELOPMENTS

248. CHUN (P) and CHU (L J). Development of plants from protoplasts of solanum. Amer. Journal of Botany. 65,5; 1978; 529-543.

Experiments were performed to determine the conditions critical to the isolation and culture of protoplasts from leaf mesophyll cells of the F_1 hybrids clonic. S. phureja x S. chacoense f. gibberulosum. callus from protoplasts cultured in upadhya's medium supplemented with glycine. Vitamins, and casein hydrolyate & subsequently transferred to Lam's medium formed roots and shoots when cultures were maintained in light mature plants were obtained following transfer to modified white's medium and later transplantation to soil.

-NIGERIA

249. OHILE (Z O). Solanum in Nigeria. In HAWKES ((J G) Eds. .symposium on Biology & Taxonomy. of solan (Bernigham) (1979) 7, 113-20.

Of the 20 species, subspecies and varieties in the genus solanum L. that occur in Nigeria, 15 are indigenous. The gens is of importance to nigerians because must of its members, produce edible edible fruits and leaves used as vegetables. This indigenous species can be divided into two ecological groups the lowland and the highland speices.

-POLLEN MORPHOLOGY - NIGERIA

250. OHILE (Z O). The pollen morphology of Nigeri an solanum species. In HAWKES (J G), Eds., Symposium on Biology and taxonomy of the Solanaceae. (Birmingham) (1978) 7; 335-38.

The pollen grains of 19 taxa of Nigerian S. were found to be have very similar apertucal status. i.e. 3 - colporate, the colpi and ora characteristics also being generally similar. The exine pattern is similar, though there are differences in the degree of distinctiveness. There are major differences in over all size and shape. The pollen morphological features are sufficiently distinct to permit the identification to the various species, subspecies and varieties.

-PROTEIN CHARACTERS

251. LESTER (Richard N). The use of protein characters in the taxonomy of solanum and other solanaceae. In HAWKES (J G) Eds. Symposium on Biology and taxonomy of solanaceae (Birmingham) (1979) 7; 225-302.

The eight solanum species were shown to be serologically distinct, but their affinities agreed fairly well with the division of the genus into two halves, Solanum and stellatipilum. Zone - and immunoelectrophoresis of species in section And roceras provided useful in formation on their relationship. Some other papers on serology of the solanaceae, are reviewed.

-RESISTANT TO VIRUSY

252. SIGGERSON (Enier I). Interspecific crosses in the genus solanum to obtain potato seedling resistent to virus Y. Lee Lend Bulk. 10; 1972; 1-21.

Several introduction of S.stoloniferum are immune to potato virus Y but most Varieties of the common potato S.tuberosum are susceptible. The transfer of immunity to virus Y from S.stoloniferum to common potato was tried & the reaction of hybrids and S.stoloniferum parents to virus Y was studied crosses were made between 4 introduction of S.stoloniferum and 4 Varieties of the common potato. This crosses produced few seeds and germination was poor.

-ROOT KNOT NEMATODE

253. JATALA (P) and ROWE (P R). Reaction of 62 tuber bearing solanum Spc. to the root knot nematode. J.of nematology. 8,4; 1976; 290.

In extensive test no g-alling or nematode reproduct-ion was found on S.acroscopicum PI3655 15'3 gourlayi oka 45 32, S.megistacrolobum OKA 4460' or S.sparsipilum PI510933, some other accessions contained many resistant plants.

-SENSIVITY TO VIRUS M

254. ZADINA (J). Sensitivity of several species of the genus solanum to virus M . Ochr. Rostl. 7,1; 1971; 13-18.

The total of all various potato forms provenances & genotypes belonging to 48 species and 11 systematic group was tested for resistance to virus M. The inoculation was carried out by means of a carborundum abrasive. The complemental tests were performed by grafting on the plants of the cultivar.

—SEXFORMATION

255. SYMON(DE). Sex forms in solanum and the role of pollen collecting insects. In HAWKES (J G), Eds. Symposium on Biology & Taxonomy of the solanum (Berminghum) (1978), 7; 386-96.

True monoecism and dioecism are not known in solanum since purely femal flowers have not been found in all cases of sexual reduction male flowers are produced with the retention of harmaphrodite flowers on the same or in a few cases on separate plants. A survey of th literature and observation on the pollen collecting insects associated with solanum suggest that these sex forms have evoluges from the need to provide pottan for specialized pollen vector.

—SPECIATION

256. WHALEN (Michad D). Speciation in solanum section Androceras. In HAWKES (J G), Eds. Symposium on Biology and Taxonomy of the solanaceae (Birmingham) (1979) 7; 581-95.

The possibility appease to be left open by general interspecific chromosomal uniformity Two kinds of reproductive barries operate between sympatric species of section, Androceras. Mechanical isolation, due to flural sizedifferences and the feature of hybrid seed to develop properly following interspecific cross pathnatuens.

—STEROIDALKALOIDS

257. SCHREIBER (K). Steroid alkaloids of solanum. In HAWKES (J G), Eds. Symposium on Biology and Taxonomy of the solanaceae (Birmingham) (1979) 7; 193-201.

The recent knowledge in the occurrence and chemical structure of steroidal alkaloidglycosides and alkamines from solanum are reviewed special emphasis is given to these solanidanes, the spirosolanes, the 18 - unsubstituted 22,26- epiminocholestanes the alkaloids with an x - epiminocyclohemiketal moiety and the 3 - aminospirostanes.

- STUDY OF CHROMOSOMES AND NUCLEAR INSTABILITY

258. MUKUMOTO (K). Nuclear instability and chromosomal mosaicism in the polyploids of solanum sp. and hybrids. Jap. J. Bot. 18,2; 1962; 19-53.

Studied nuclear instability and chromosomal mosaicism in colchicine indvced polyploids of Solanum integrifolium varhiserna.

- STUDY OF POLYPLOIDY

259. LARSEN (P). Study of polyploidy in the genus solanum. Proc. of Amer. Soc For Hort Sci. 51; 1948; 342.

Polyploidy in the genus solanum was studied & production of dry matter, rate of photosynthesis respiration and development of leaf area in some diploid, antotetraploid and amphidiploids solanums. K.Danske videnskab. Selskaes. Biol was studied. Polyploidy in the genus solanum was most important one it further studied by these authors. Respiration and development of leaf area in some diploid were found.

- STUDY STEM TISSUE

260. HAYDEN (R E) etc. Electrical impedance studies of stem tissue of solanum clones during cooling. Can. J.Bot. 50,7; 1972; 1547-1554.

Specific electrical impedance measure-ments made on the stems or petioles of 4 varieties of Solanum were found to discriminate various clones when the plants were grown and tested under carefullycontrolled condition Frost hardiness of clones was related to the depression of the freezing points in the absence of super cooling to the specific resistance at 4.4.°C to the slope of the long impedance temperature cooling curves.

-STUDY OF VIRUS

261. GASPAR (Istvan) and GYULANAGY ( ). Resistance of some of solanum species and their hybrids to virus Y of potato. Novenytermeles. 19,1; 1970; 31-8.

The test A6 was used to detect the presence of virus in symptom - free individuals. After mechanical infection the virus could not be demonstrated in the progeny of S. andigenum. From 30 clones of various crossing combinations, 14 remained symptom - free even after infection by inoculation. These plants was considered immune.

SOLASODINE - SAPONIN HYDROLYSIS

252. SEGAL (Ruth) etc. Solasodine stability under conditions of saponin hydrolysis. J. Pharm. Sci. 1978; 1169-70.

The extent of formation of solasodiene from solasodine (solanum Spp.) upon treatment with hydrochloric acid under various conditions were determined. The deine formed was as sayed by using the characteristics extinection at 256 mm. Diene formation was affected by the acid conc. and the boiling point of the solvent used. Optimal conditions for the hydrolysis of solasadive glycosides are suggested.

TOMATO - ABSCISIC ACID - FRUIT DEVELOPMENT

263. DORFFLING (K). Quantitative changes in abscisic acid content during fruit development in S.lycopersicum. Planta. 93,4; 1970; 333-42.

The presence of Abscisicacid (A B A) in methanol methanol extract from tomato fruits was determined by thinlayer chromatography In 2 growth period quantitative changes of the ABA content in growing fruits of the cultivar. The absolute content of ABA was increased during fruit development, reached maximum and then decreased in ripening fruits. The ABA conc. was also hiegheat in un ripe fruits and decreased during ripening.

-EFFECTS OF CULTIVAR

264. WILLIAMS (J W) and SISTRUNK (W A). Effects of cultivar, irrigation, Ethephon, and Harvest date on the yield and quality of Tomatoes. J.Amer. Soc. Hort. Sci. 104,4; 1979; 435-39.

The Arkansas selections 74-41 and 74-42 produced higher of Canning ripe tomatoes than either chico III or Roma VF in 1976 while 74-41 and UC-134 yielded higher than chico III and Roma VF in 1977 Ethephon increased the yield of canning ripe fruit in 1976 but not in 1977 when rainfall was higher .

-DETERGENTS

2185.GUMINSKI (S T)etc. Effect of some detergents on the increase in bio mars and the accumulation of mineral components in Solanum Lycopersicum and Scenedesmus quadricauda. Acta soc Bot pol 41,2;1972; 255-64.

The investigation on water cutures of tomato seedlings and S. quadricauda Colonies showed that low doses of the detergents stimulated growth of these plants. An untensified accumulation of N,P,Ca, Mg,Fe, and a reduced accumulation of K ions were observed .

-INDUCED RADIATION

2186. VEEKERK (K).Radiation induced easy peeling and oblong fruits mutants of the tomato. J.ofAgri Sci 17,3;1969 321-8.

The genetics of 2 radiation induced mutants of tomato cultivar, easy peeling and oblong fruits with strong skin were studied. Both were governed by a single recessive gene. The combination of both traits was achived by crossing I was possible to break the association between oblong fruits & strong skin.

-INFLUENCE OF GENES

2187.MOGLASSON (W B) and FRANLIN (M J). Influence of the Nr, rin and nor genes on changes in Abscisic Acid and gibberellin activity during growth and senescence of Tomato Fruits. J.Amer Soc. Hort. Sci. 104,4; 1979; 455-59.

Low levels of abscisic acid (ABA) were found at 10 day after anthesis in fruits of normal cultrvars and of the abnormal ripening mutants (Nr,rin, nor) of tomato. The result showed that the patterns in the levels of ABA, PA and gibberellin from about 14 days after anthesis are related to ripening or sene scence in the four strains and not to growth.

-MICROSPORES - EFFECTS OF VIRADIATION

UPON STARCH.

268.DENETHANCOURT (Dreux) and COSTA (Eriksen). Effects of viradiation upon starch formations and starch hydrolysis in tomato microspoes. Horidetas. 60; 1/2;1968; 167-78.

With the aims of delecting pattern markers in L. esculention an analysis was made the effect of irradiation upon starch form and hydrolysis in tomato micropoles. Bud iriadiation tended to inhibit starch hydrolysis in the microspies. For this criteruim the period of greater was observed to take place shortly prior shortly prior to pollen mitrosis.

-RADIO SENSITIVITY - HEAT

269.PALENZONA, D L) etc. Heat induced chanqes of the radio sensibility of the tomato. Genet. Agri. 21; 1/2/3; 1967; 238-48.

Seeds from two tomato cultivars. Rutgers and Bertiane were gives heat treatment during germination The heat treatment germinated the seeds at 54°C Heat treated as well as untreated plants were self fertilized for 2 subsequent generations. At the 3rd generation seeds from both groups, At the 3rd generation seeds from both groups. If plants were x + viradated.

-SEGREGATION AND RECOMBINATIONS

270.RICK (Charles M) Further studies on segregation and recombination in backross derivatives of a tomato species hybrid. Bton Zentralbl. 91,2; 1972; 209-20.

Saggregation and backcrosses of the hybrid lycopersicon esculentum pennellii to linkage tester stocks of the former species. Replicatin of various kinds revealed a remarkably low non genetic variance and for the recombination in the esculentum controls of the chromosomes 5 data significant differences between reciprocal crosses. The effect of prior crossing over was tested on recombination in 5 intervals of chromosomes 5.

—WILT CONTROL

271. OPHSA (F) and RASILA (C). Possible bacterial wilt control. Alatua. Agri. Bull. 1,1; 1976; 12.

pseudomonas solanacearum causing the most serious disease of tomato and other solanaceous crops in western samoa, was reduced by C. 67% on soil treatment with lime at C. 0.5 ton/acre.

— —DISEASE

272. KOBAYAKE (Hirofumi) etc. Spotted wilt disease of tomatoes in Japan. Ann Phytopathol Soc. Jpn. 42,3; 1976; 287-94.

By sap inoculation test 30 spp. out of 56 spp. in 11 families were found to be susceptible to the casual virus. Symptoms consisted of pronounced necrosis, especially in Solanaceae. In epidermal strips of infected tomato and Datura stramonum cellular inclusions were observed. The virus was also transmitted by a thrips thripstabaci, but notthrough in fected tomato seeds.

TORUVM - MOSAICVIRUS APHISGRACIVORA - RELATIONSHIP

273. [redacted]) etc. Relationship between solanum torvum mosaic virus and Aphis craccivora and A Gossypii. Indian. phytopathol. 28,2; 1975; 209-211.

A single viruliferous A. Craccivora and a minium of 3 aphids of A. Gossypii were ableto transmit the virus. The maxium percentage of transmission was obtained with group of 15 aphids/plat(Nicotiana glutinosa) in both sps. The acquision feedings period were 405 and 605 fpr A.craccivora and A. Gossypiihi , respectively, and the inoculations feeding period of 605 for both. Primilinary fasting for both aphid vectors increased transmission efficiency.

VEGETABLES - DISEASERESISTANCE

274. WALKER (J C). Disease resistnece in the vegetable crops. Bot. Rev. 7,9; 1941; 458-506.

The common vegetable crops are very much diseases resistance, Eggplant are highly resistance to phomopsis vexans. Bacterial wilt is a very serious disease in the tropics In papper sweet varieties are subject to anthracnose while hot varieties are resistance sweet potato showsthat a widde range of resistance and susceptibility to stemn rot occurs. potato has also resistance to late blight.

- EFFECTS OF DINTROANILINES

275. ESHEL (Y) and KATAN (J). Effects of dinitroanilines on Solane oecus vegetables and soil fungi. Weed Sci. 20,5; 1972; 443-46.

The phytotoxicities of 4 substituted dinitroanilines to egg plant (Solanum melongenal) Paper (Capsicum-annum) and tomato (Lycopersicon esculentum) were studied Nitralin and trifluralin were most active in hibiting the root elongation and top growth of these plants, the effect of benefin was intermediate and isopropalin was the least active herbicide. The order of crop tolerence was as follows tomato paper egg plant.

-OEDGREEN

276. PATHAK (Ram Sumer). Effects of "Oed Green" on certain vegetables. J.Res.Punjab. Agr. Uni. 6,3; 1969; 430-33.

One percent "Oed Green " suspension was effective as an antiwilting and freeshness conserving agent in vegetables like brinjal (Solanum Melongena) and tomato (Lycopersicum esculentum). Increased vegetable growth and had beneficial effects on economic characters.

-SEEDS - FUMIGANTS

277. TOMAR (H G) and YADV (T D). Effect of some common fumigants on the germinability of vegetable seeds. Indian J. of Entomol. 27,4; 1965; 472-75.

Ethylene dichloride carbontetrachloride and then 3:1 ,oxtire are safe fi,ogamts fpr tjo seeds pf beet, brinjal, cabbage carrot, chilli, onion, tomato, turnip. etc. vegetable seeds are very much effected by these fumigants. Specialy the brinjal and tomato is very sensitive to these fumigants.

VERNIEI -STUDY OF DIFFERENTIATION

278. [redacted] (H). Differentiation between Heterodera rosto ohiensis and an undescibed allied species by female colour morphometrics and pathogenicity. Nematologica. 18,2; 1972; 265-69.

In manybackcrosses isolated major genes for resitence from solanum vernei, S. spegazzinii and S. oplocense reduced cyst formation ## all tested golden ldan populations almost to zero including the populations that produce on H_1 resistant varieties (Ver. Ex S. andigena CPC 1673).

VERRUCOSUM-CROSS BREEDING - MALE STERILITY

EFFECTS OF PLASMONES

279. ABDALLA (M M F) and HERLDEN (# G T). Plasmons and male sterility types in solanum verrucosum and its interspecific hybrid derivatives. Euphytica. 21,2; 1972; 209-20.

S. Verrucosum (2n = 24) is easily crossable with many diploid species and haploids but usualy as as a female partner only. All interspecifichybrids studies appeared male sterile due to interaction of S.verrucosum plasmons with genes from male parents. Seven male sterility types have been discovered in the investigations made on 218. Verrucosum introduction and their interspecific hybrid derivatines.

VIARUM - MACROMUTANTS AND SOLASODINE

280. DNYANSAGAR (V R). and FINGER (A R). Correlation between macromutants and Solasodine content in solanum vierum. planta. Medica. 31,1; 1977; 21-25.

From a study of eleven matants induced by seed treatment with ethyl methanesulphonate and r ray and varying in height, branching leaf size leaf weight, berry size, berry number and solasodine contents. It appeared that solasodine content was directly related to the total quantity of photosynthetic tissue.

XANTHOCARPUM AND MELONGENA - CROSS

281. RAJASEKARAN (S). Solanum X-anthocarpum schrad and wendl. X.S. melongena L. and its amphidiploid. Caryologia. 24, 3; 1971; 261-67.

The F_1 hybrid, *S. Xanthocarpum* X *S. Melongena* L. was completely sterile despite of normal meiosis. Fertility was restored by chromosome doubling of the F_1. Sterility is therefore, attributed to cryptic structural hybridity. The amphidiploid was characterised by low multivalent formation and appears to be a segmental allopolyploid.

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